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THE FAR EASTERN REVIEW

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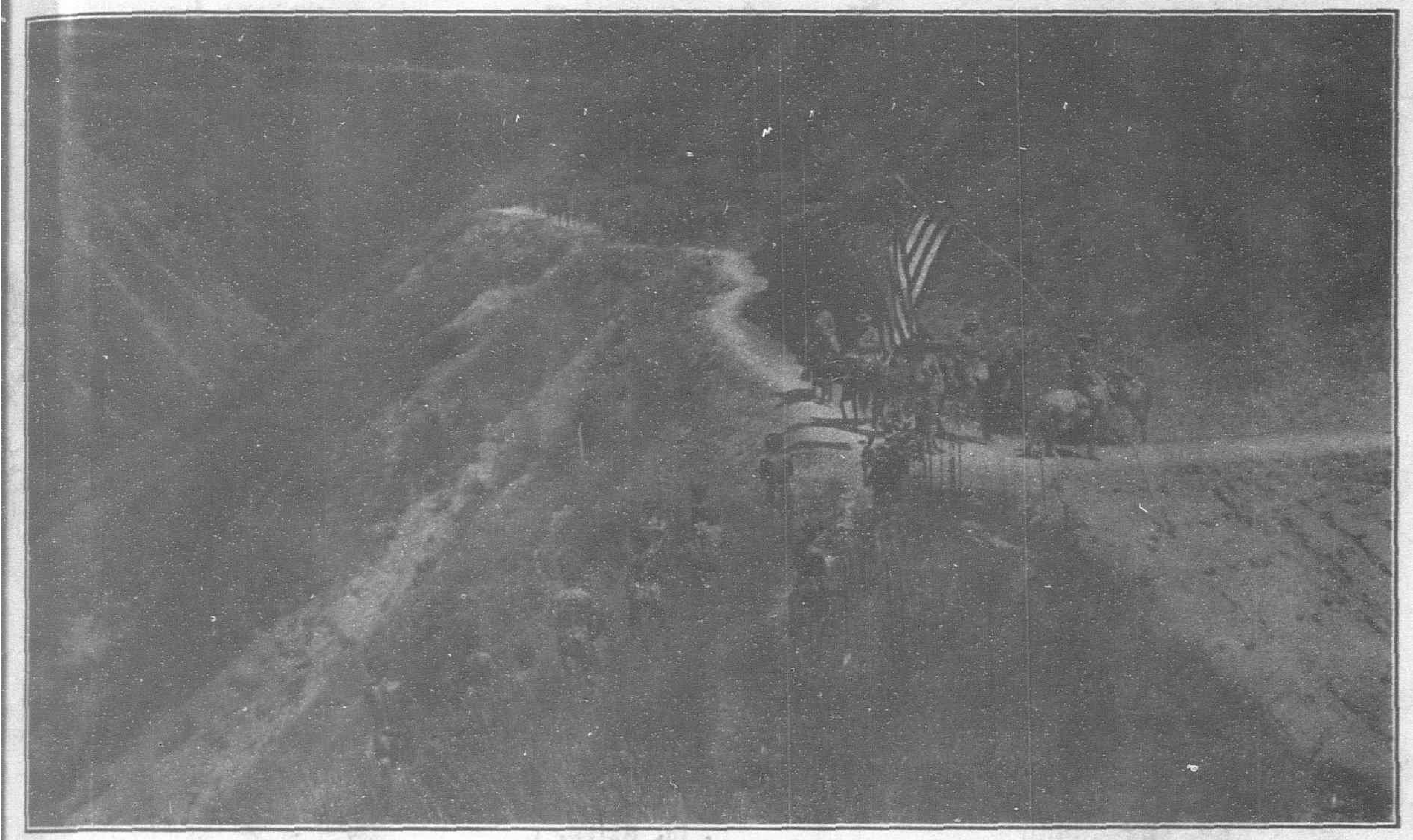
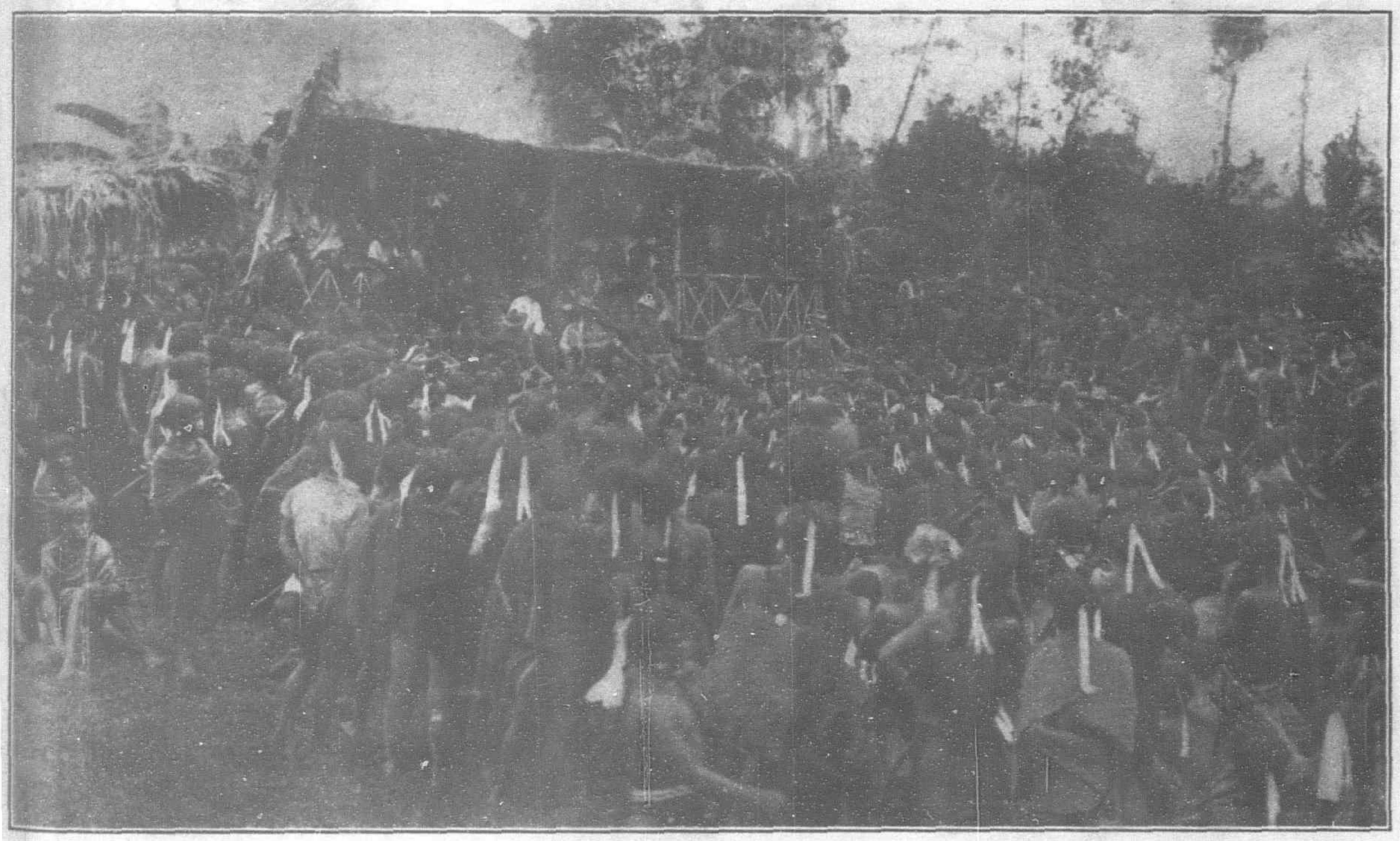


TYPICAL MOUNTAIN TRAIL

The Mountain Province and Nueva Vizcaya are now traversed by more than 800 miles of trail of this type. A "reception committee" of Ifugaos with an American flag have come out to meet the Secretary of the Interior and his party



A CONFERENCE BETWEEN THE SECRETARY OF THE INTERIOR, GOVERNOR OF THE MOUNTAIN PROVINCE, LIEUTENANT GOVERNOR OF THE SUBPROVINCE OF IFUGAO, AND HEADMEN OF THE DISTRICT OF QUIANGAN

Upon the annual inspection trips of the Secretary of the Interior there are held great representative gatherings of the several non-Christian tribes, at which the events of the past year and the plans for the coming year are freely discussed

Courtesy, Department of the Interior

The Hill Tribes of the Philippines

◆

The Lanchow Mines

◆

General News and Comment

ENGINEERING
COMMERCE ◆ FINANCE

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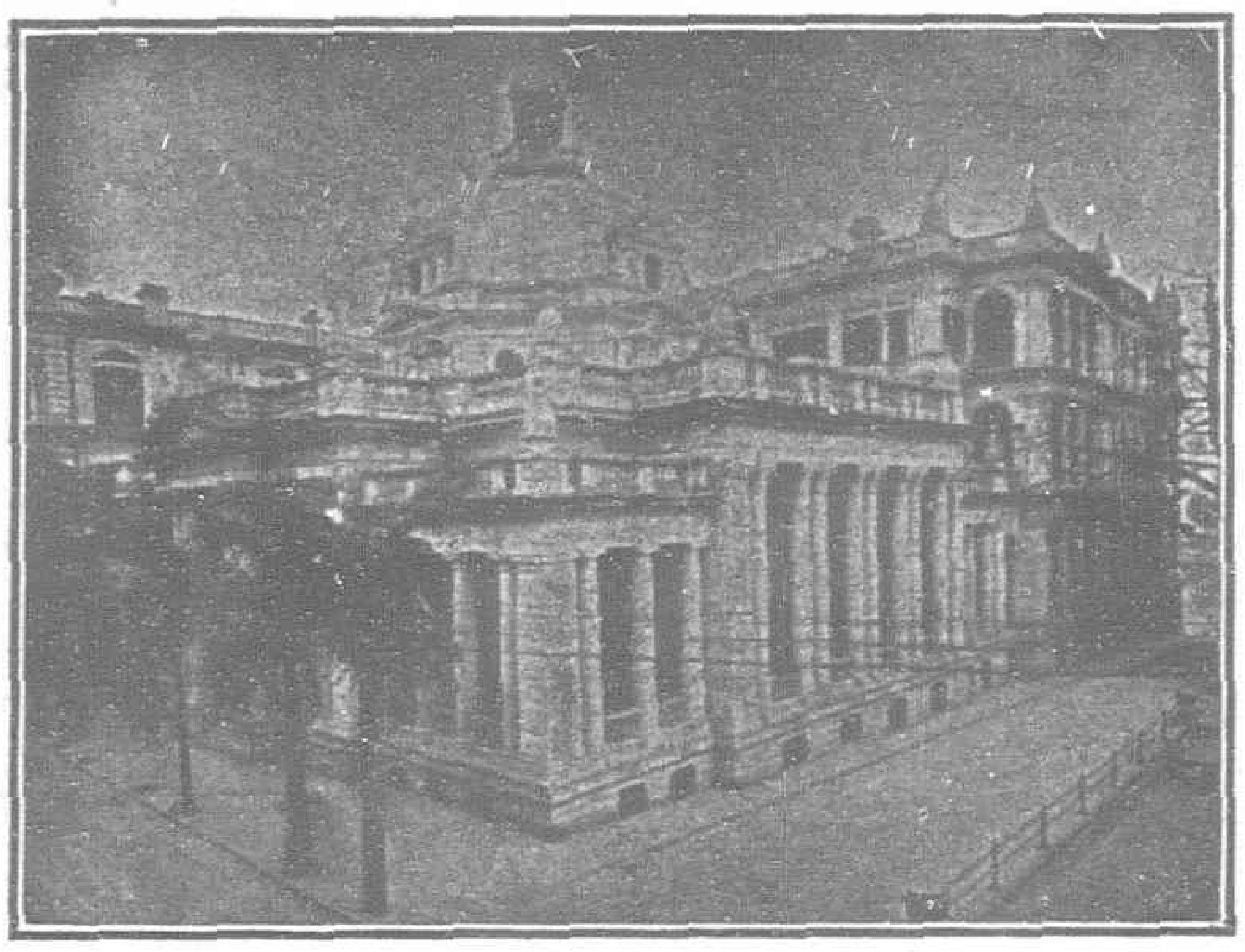

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Supplement to
THE FAR EASTERN REVIEW
July, Nineteen Hundred and Eleven

His Excellency BARON S. GOTO
MINISTER OF COMMUNICATIONS

THE FAR EASTERN REVIEW
COMMERCE ⊛ ENGINEERING ⊛ FINANCE

VOL. VIII. MANILA, P. I., SHANGHAI, AND YOKOHAMA, JULY, 1911 No. 1.

THE LANCHOW MINING COMPANY LIMITED

The Lanchow Mining Co. was founded two years ago with the administration in Tientsin. The mines are situated in the vicinity of Kaiping and join in the eastern and western direction the mines of the Chinese Engineering and Mining Co. in Tongshan and Linsi. They extend to a length of fifteen miles parallel to the Imperial Railways of North China about three miles distant to the north of the stations Kaiping, Wali and Kuyeh.

MACHIAKOU.—The principal mine and the works administration buildings are in Kaiping-Machiakou. Two shafts have been sunk here, of which one is arranged for double haulage. The surface plant of the main shaft comprises the headgear hall and steel coal dressing hall with a capacity of 225 tons per hour. The coal dressing plant and the transport machinery and appliances are driven by electricity and two electric hoists serve as connections between the platforms.

The boilerhouse and the shaftbuilding are connected by a steel bridge. At present there are installed seven Lancashire Boilers provided with superheaters and traveling chain grating, ash hoist, both driven by electricity and two boiler feed pumps.

In August 1909 a provisional power station, with engine of the semi-portable type installed, was erected, which provided the electric energy for the shaft draining pump, the hauling winch, one small mine ventilator, one pumping plant erected on the river about one mile distance, and for the electric lighting.

The regular power station, with compound steam engine of 1200 H. P. norm. and 1500 H. P. max. has been working since July, 1910

The plant supplies the larger motors with three phase alternating current of 3000 volts, smaller motors after passing transformers with current of 500 volts tension, and other motors with direct current of 110 volts.

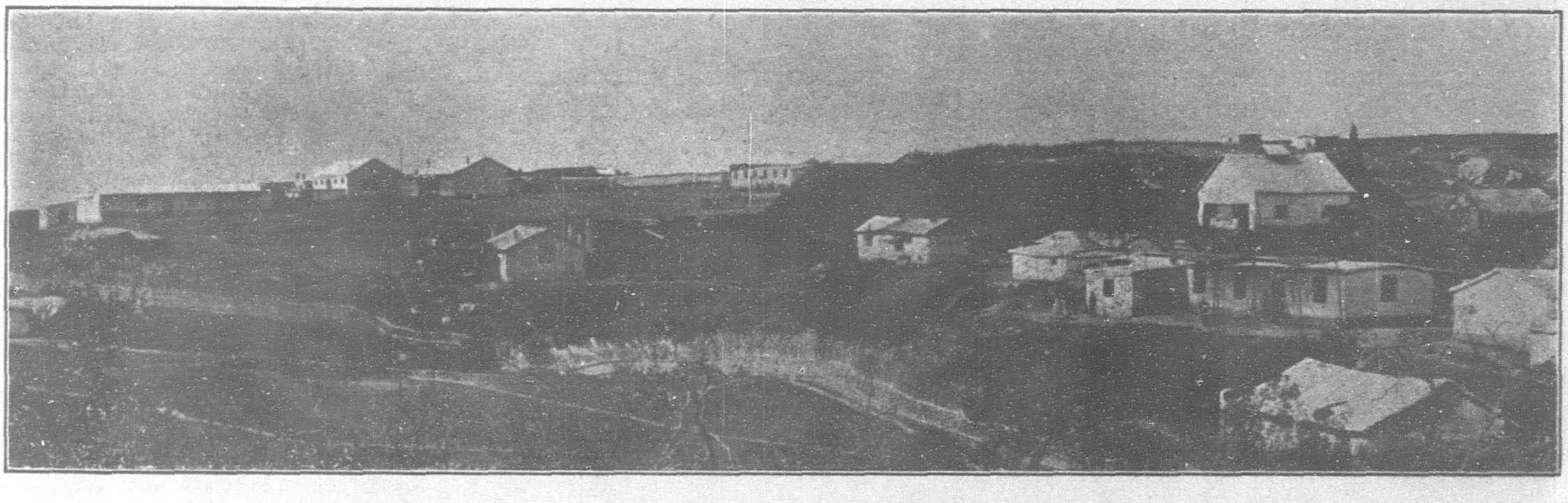
The steam engine is designed for working in connection with a condenser plant or direct exhaust to the atmosphere. A second similar plant is to be erected in 1911, and for a third unit it is intended to erect an exhaust steam turbine.

The ventilation of the mine is effected by two electrically driven fans. The capacity of the main fan is ca. 4000 cbyrds—and of the auxiliary fan ca. 3000 cbyrds. of air per min.

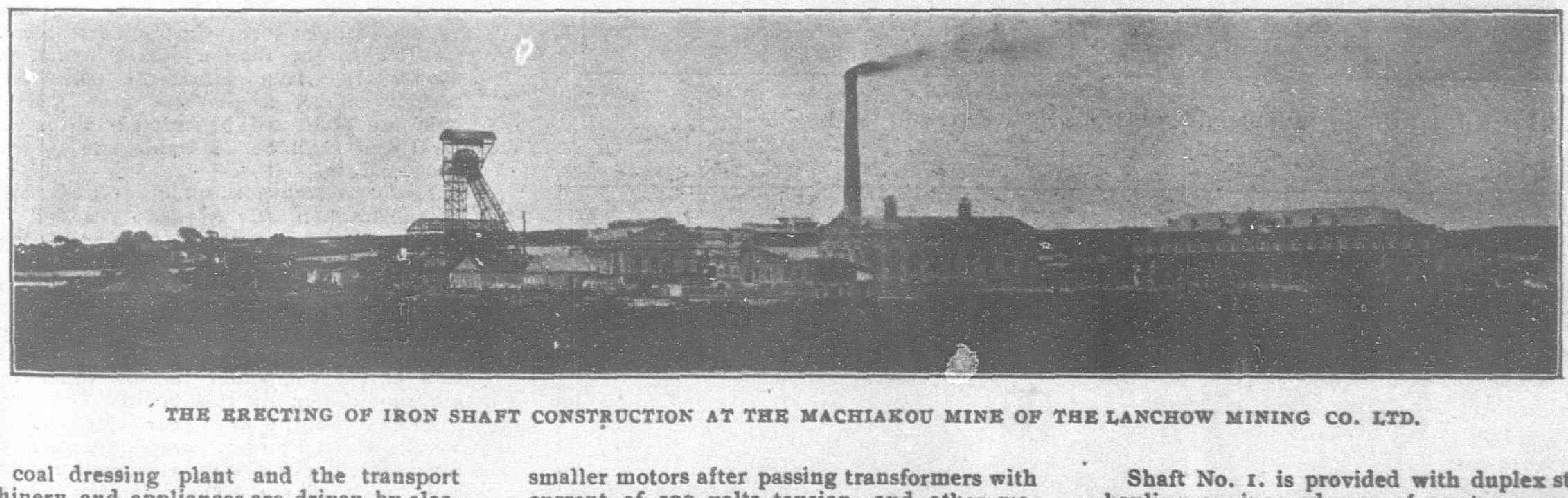
Hauling gear, fans, drills, coal cutters and transport appliances under ground are driven by electricity and may also be driven by compressed air.

A small air compressor in connection with a semi-portable steam engine was first used when starting the mine. Since March 1911 a large electrically driven air compressor with a suction capacity of ca. 5500 cbyrds. per min. has been erected.

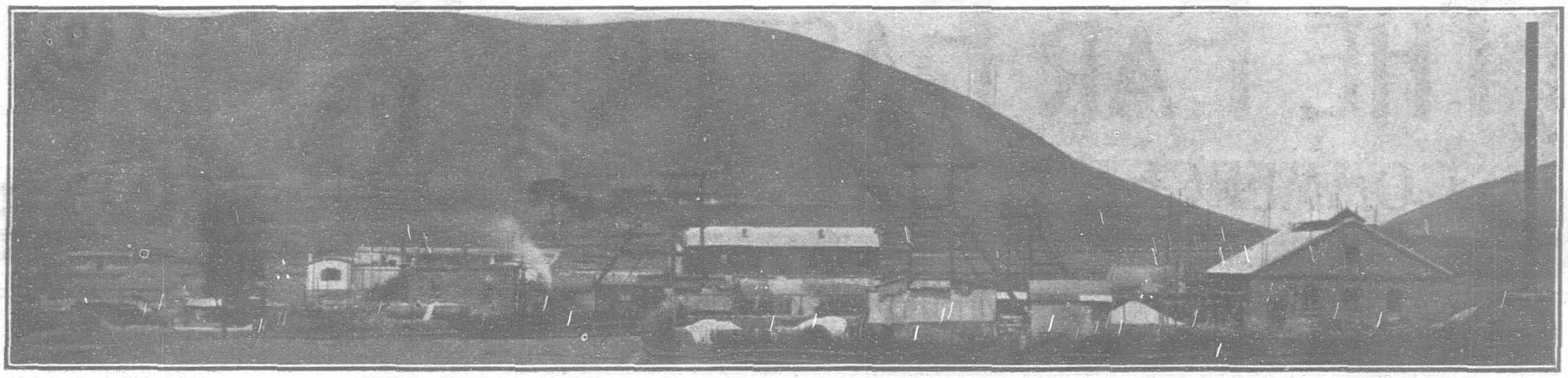
Shaft No. 1. is provided with duplex steam hauling engine and gear of 150 tons capacity per hour. It is intended to erect a second electrically driven hauling set of the same capacity.



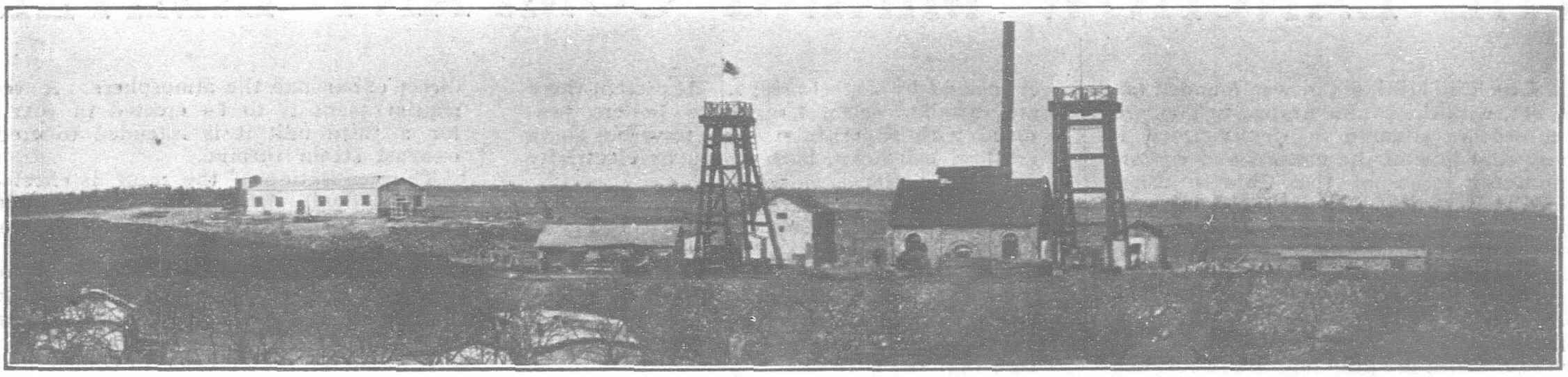
THE CHENCHIALING MINE OF THE LANCHOW MINING CO. LTD.



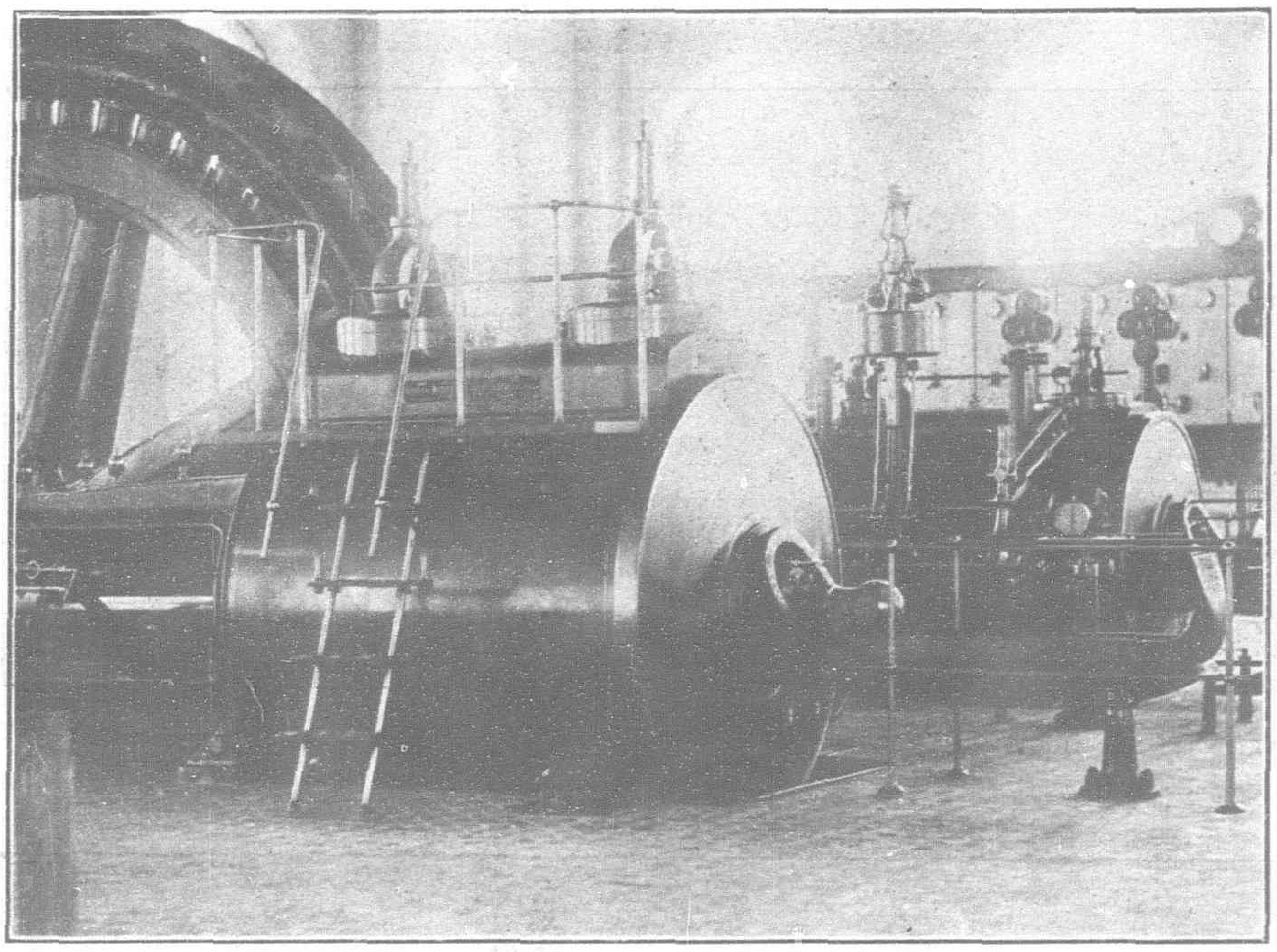
THE ERECTING OF IRON SHAFT CONSTRUCTION AT THE MACHIAKOU MINE OF THE LANCHOW MINING CO. LTD.



THE CHÔWKOCHWANG MINE OF THE LANCHOW MINING CO. LTD.



THE TAOYUAN MINE OF THE LANCHOW MINING CO. LTD.



DYNAMO, ENGINE NO. 1, MACHIAKOU MINE

Shaft No. 2 has a smaller steam hauling set of 50 tons capacity per hour. Since July 1910 a repair workshop with saw mill and 20 electrically driven machine tools has been installed. Two spacious store buildings, a timber yard, two coal yards, one provisional loading bridge, four oil tanks, one store for explosives, one truck scale, one locomotive shed, one water cleaning plant, one bath for mine officials, one construction office with store for building material, two sales offices for coal and one laborer registration office, complete the buildings and constructions over ground. One iron foundry plant is under construction.

One shunt locomotive has been working since January 1911, and a second one has been arranged for. A modern water supply for domestic purpose and for fire hydrants is under construction.

It is intended to erect the following plants in the next year or so:—press coal plant, coal washing plant, coke plant, by-product recovering plant and central condenser plant. About 40 small coke ovens are used at present for the production of small quantities of coke.

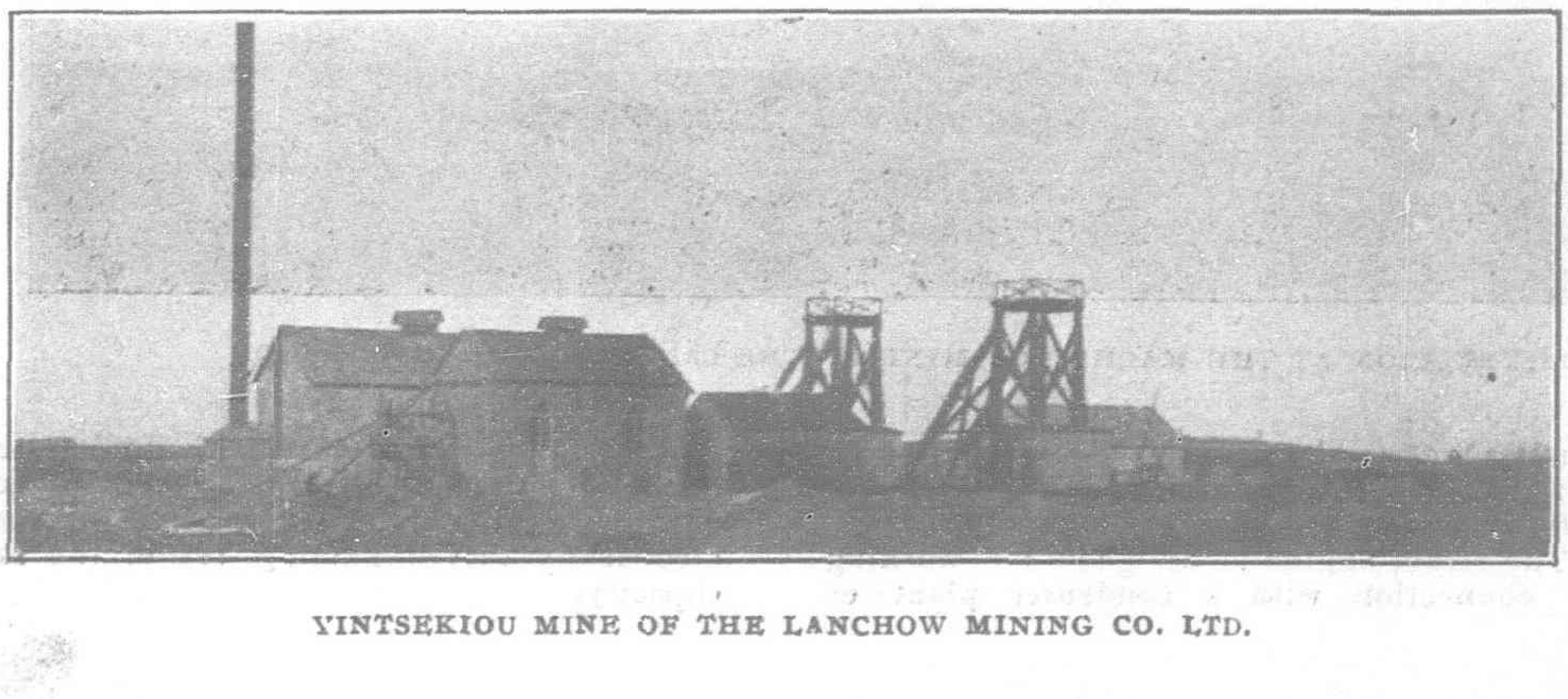
Four layers of bituminous coal have been disclosed, which measure from 2 ft., 4 ft , 22 ft. and 45 ft. in thickness.

The water entering the mine amounts to 2.7 cbyrd. per min. On the first level, in addition to the regular shaft pump, is an electrically driven centrifugal pump with a capacity of 2.5 cbyrds. per min. The main pumping plant will be erected on the second level and shall be of ample size to leave a good margin.

The coal transport under ground will be of the mechanically worked type and probably compressed air locomotives will be used.

A miners' compound with hard roads, post office and numerous business places is partly completed. An independent land board has been formed with its own offices in the compound. Besides looking after the administration of the compound various other works are undertaken by this board.

Already in the first year 1,250,000 trees were planted (mostly acacia) which were obtained from the Imp. German forestry reserve in Tsingtau. The planting of trees will be continued on account of their great value to the tree bare country and it is also hoped that useful mining timber will be produced.

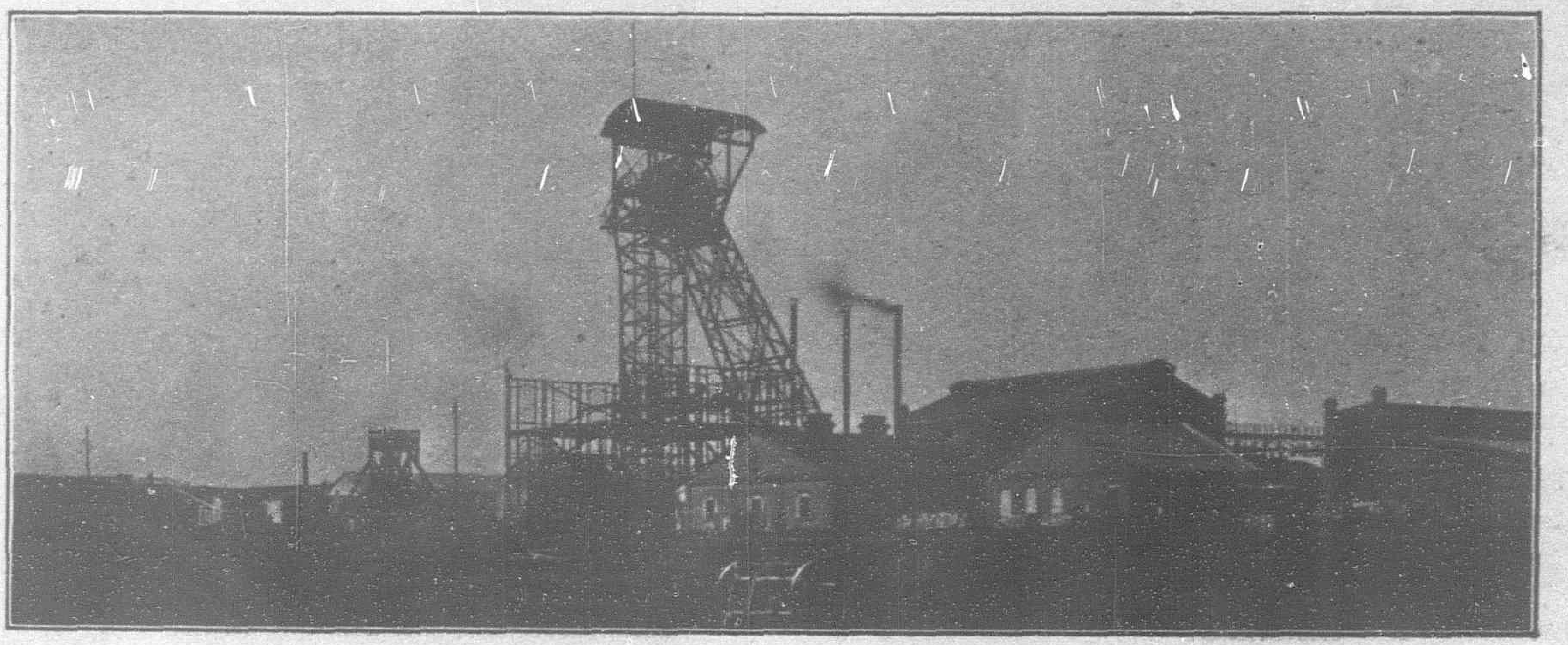


YINTSEKIOU MINE OF THE LANCHOW MINING CO. LTD.

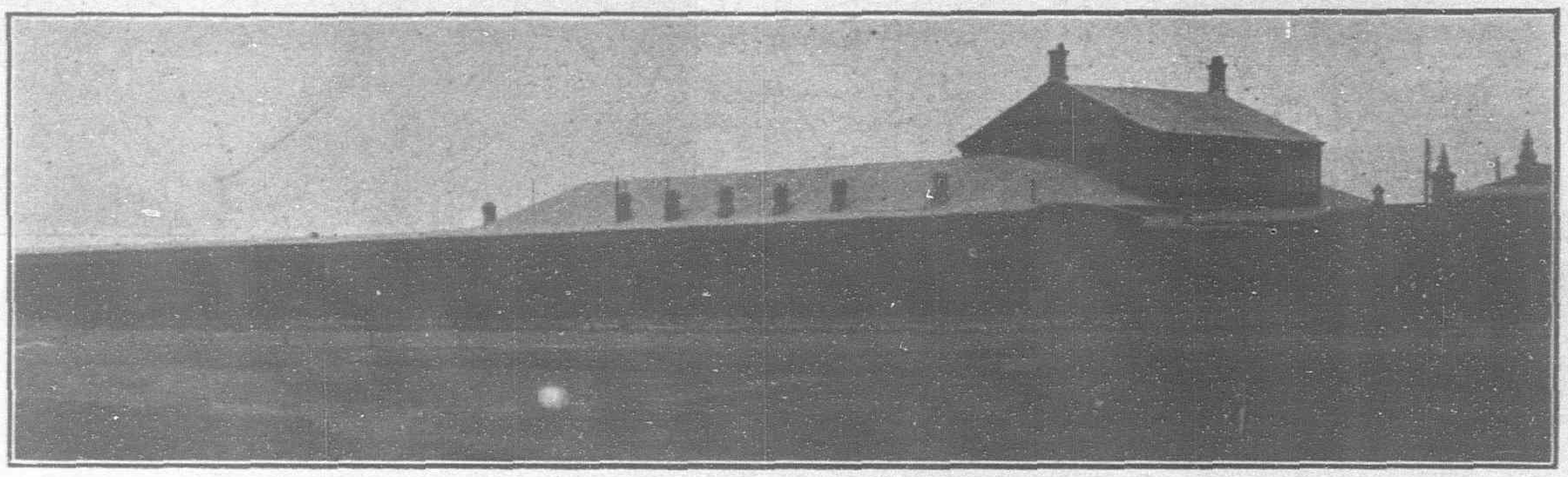
In close vicinity to the mine a hospital has been erected by the company provided with operating hall, dispensary, laboratory, rooms for convalescents and a newly started park. A Chinese doctor is in charge. Two isolation hospitals have been erected to provide against the outbreak and spread of epidemic diseases.

In December, 1910, a technical college was founded for the training of future mining officials. It was started with 20 pupils and in March, 1911, 33 scholars were under training.

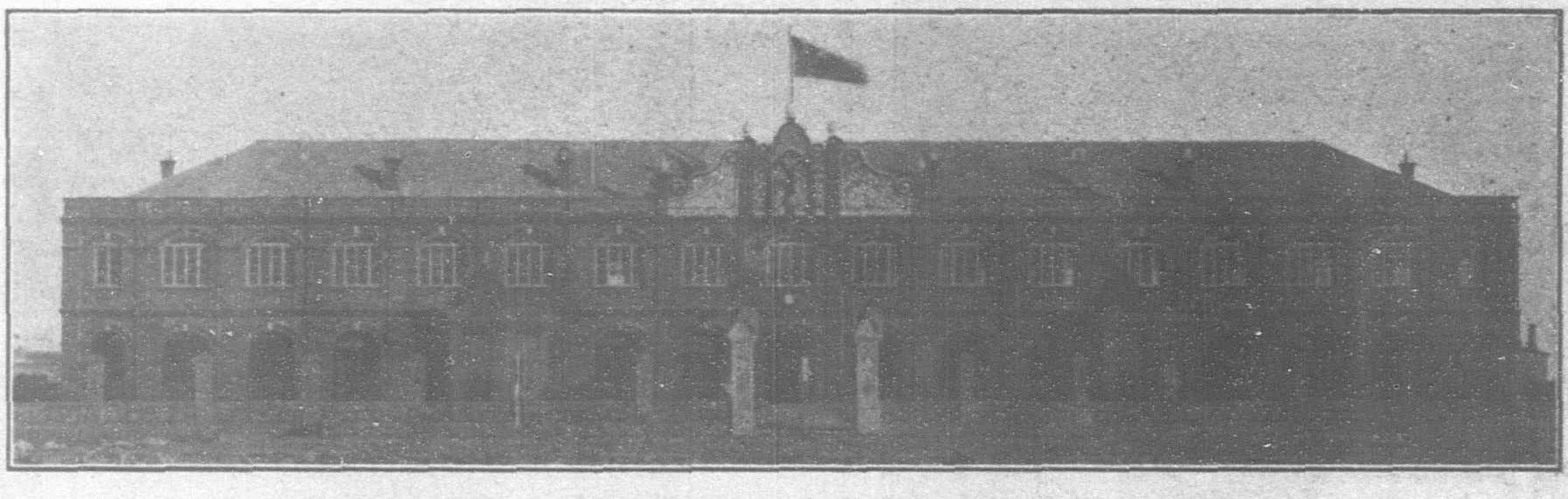
YINTSEKOU, LANGWEIKOU, CHENCHIALING AND TAOYUAN.—In the eastern direction of Machiakou are the four small mines: Yintsekou, Langweikou, Chenchialing and Taoyuan, all provided with steam boilers feed pumps, steam winches, steam shaft pumps and partly with steam hauling gear. There are further offices, workshops, stores, and a water cleaning plant. At the Yintsekou mine there has been installed another electric plant for lighting the mine on the surface as well as underground. There is also one electrically driven mine ventilator of 2500 cbyrds. capacity. The current is transmitted from Machiakou by means of an overhead wire line. At Chenchialing hand worked winches were used to some extent until the



ERECTING OF IRON SHAFT MACHIAKOU MINE

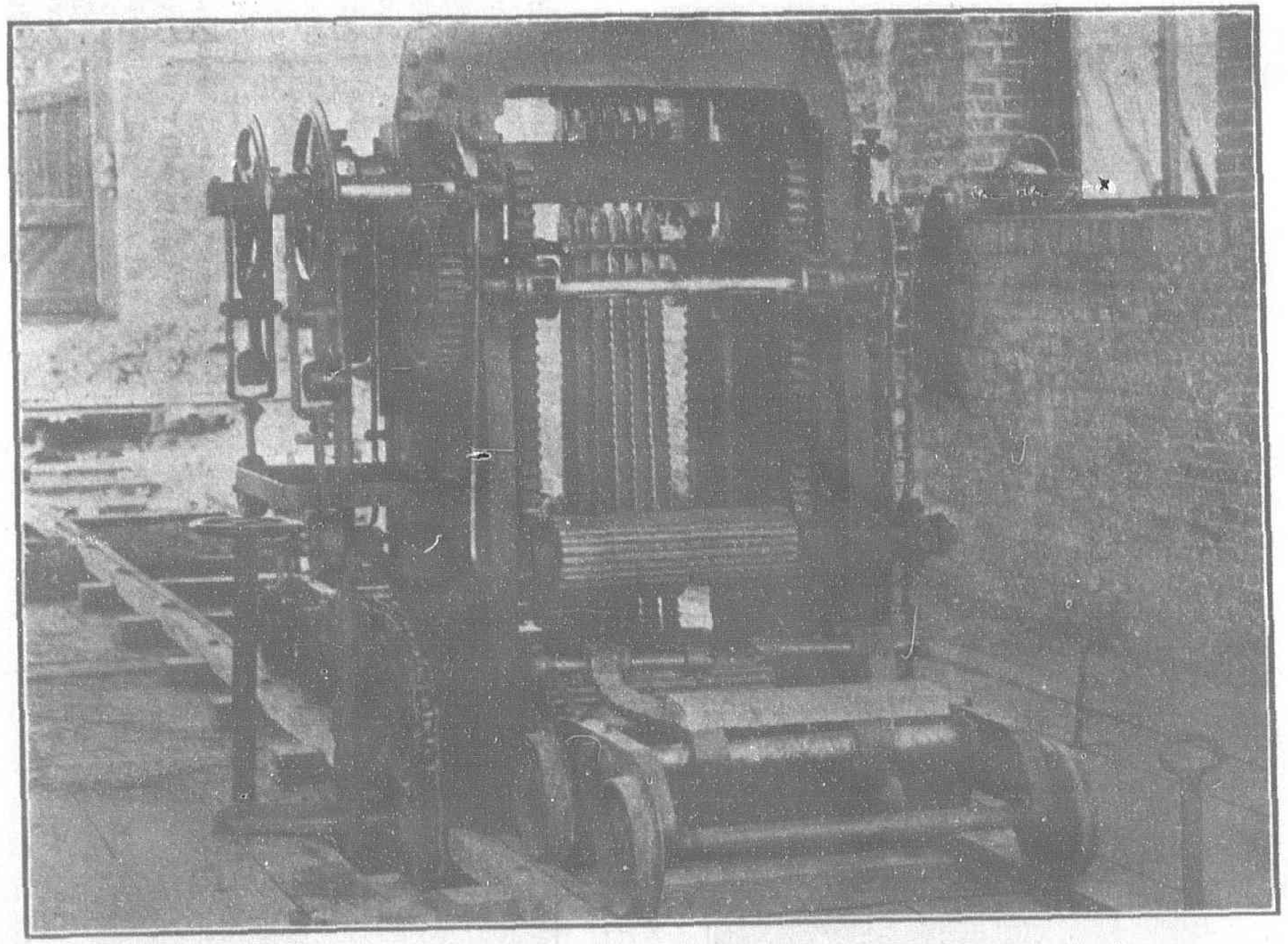


LAND DEPARTMENT OFFICE AT MACHIAKOU OF THE LANCHOW MINING CO. LTD.

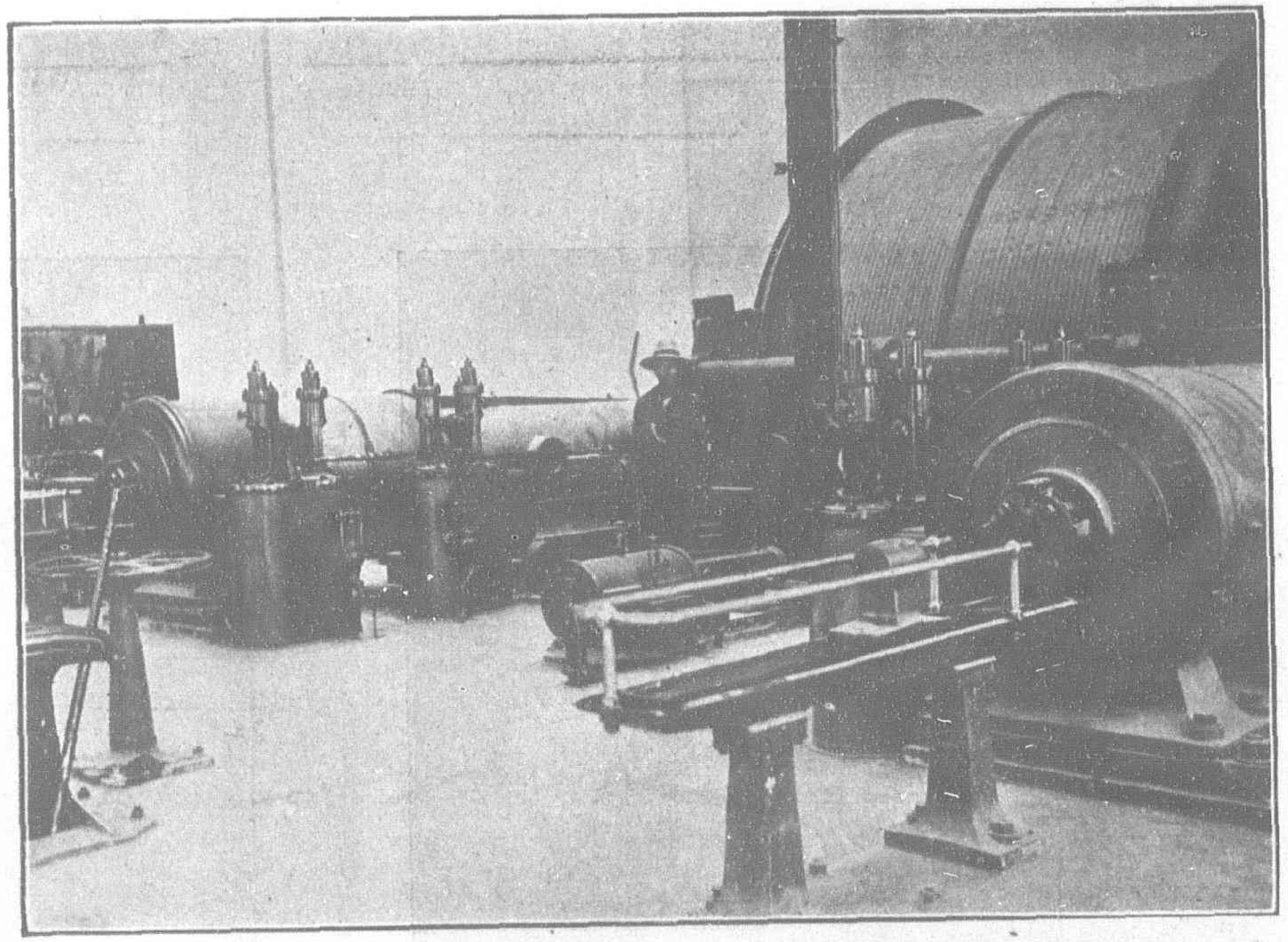


OFFICE BUILDING OF THE LANCHOW MINING CO. AT MACHIAKOU MINE

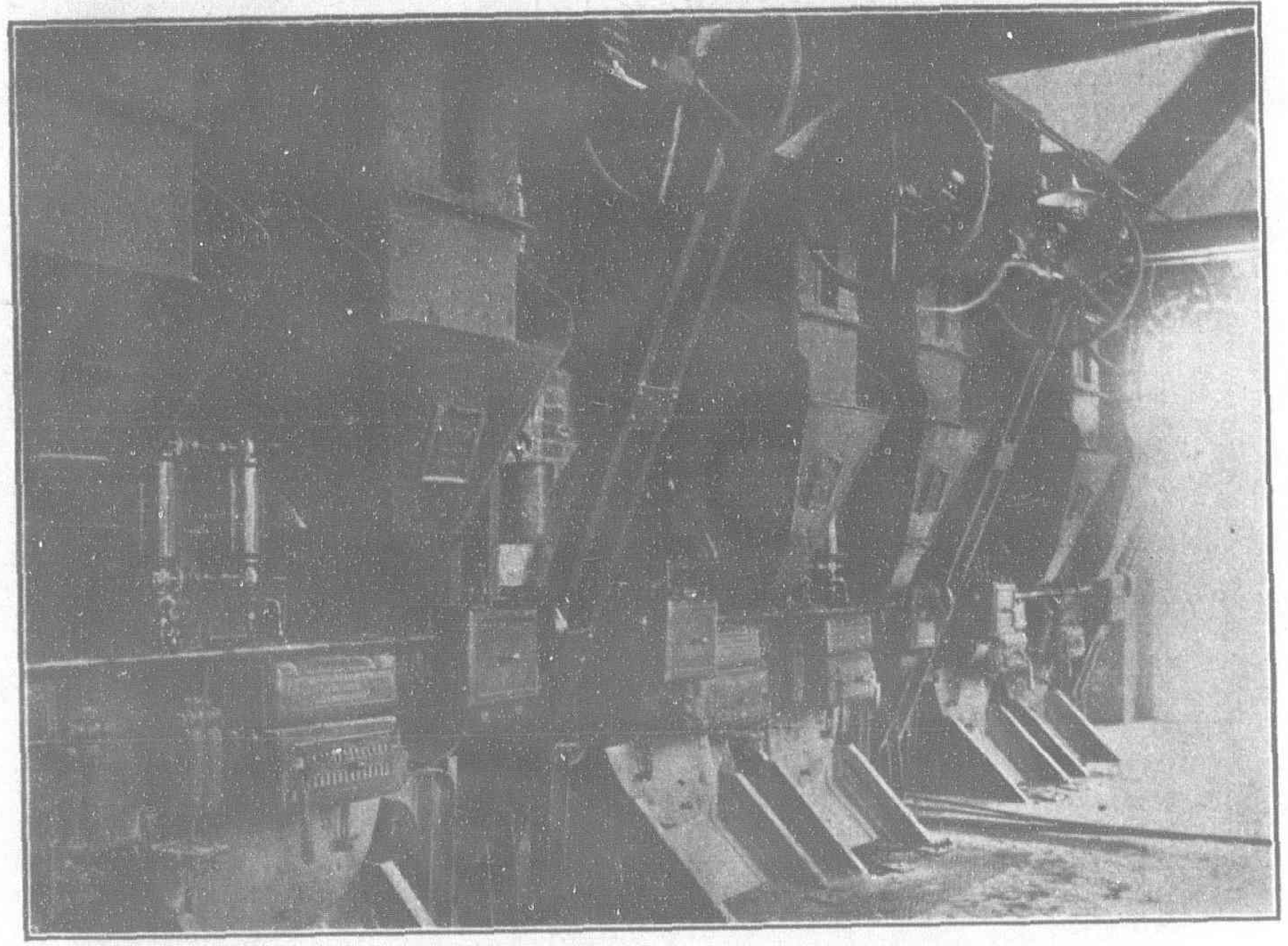
LANGWEIKOU MINE OF THE LANCHOW MINING CO. LTD.



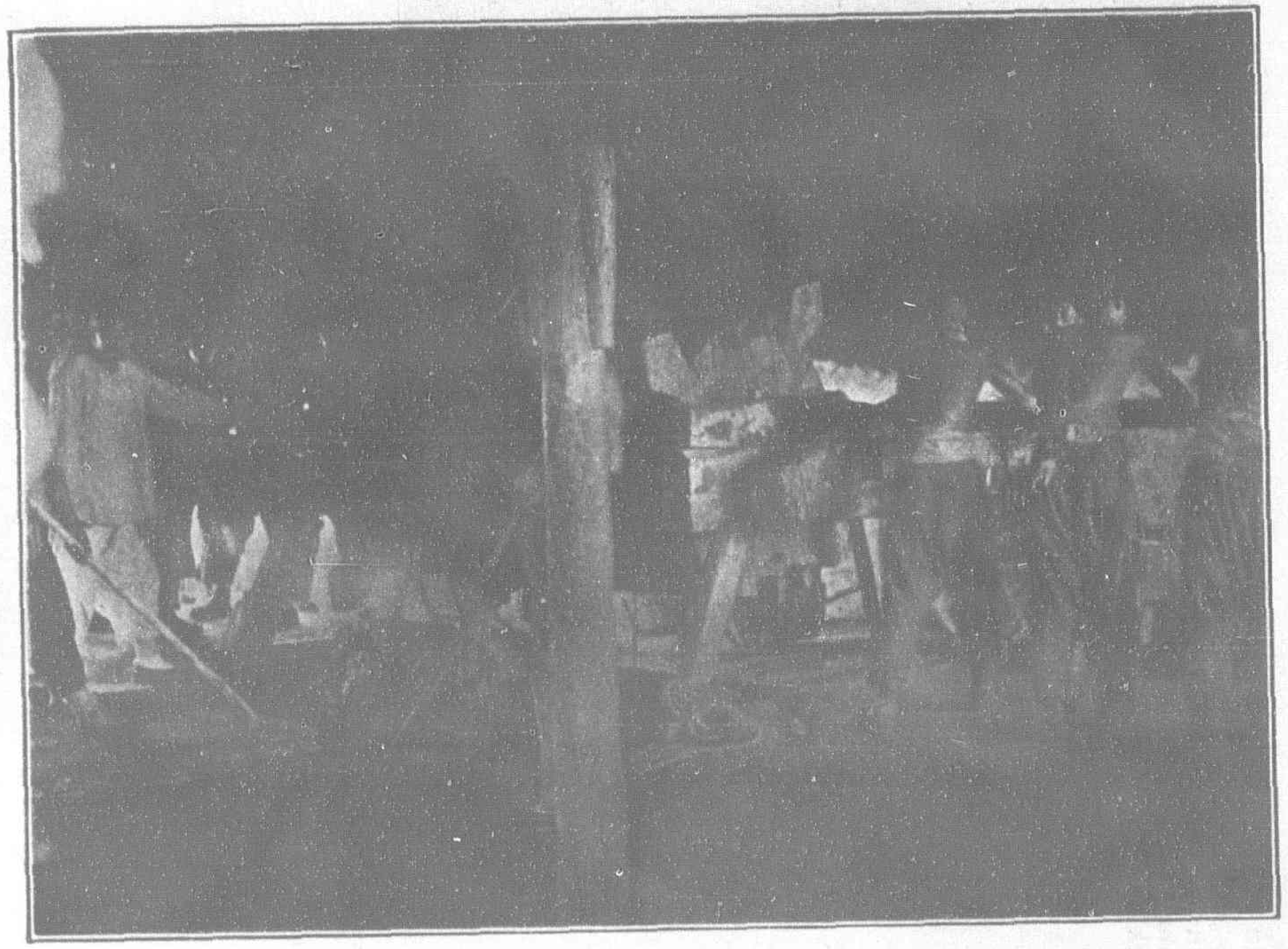
A BREAKING DOWN SAWING MACHINE INSTALLED AT THE MACHIAKOU MINE



STEAM WINDING ENGINE INSTALLED AT THE MACHIAKOU MINE



MECHANICAL STOKER INSTALLED IN THE BOILER HOUSE AT THE MACHIAKOU MINE



HAND OPERATED WINDING GEAR UTILIZED AT THE CHENCHIALING MINE

AN ELECTRICALLY DRIVEN VENTILATOR INSTALLED AT THE MACHIAKOU MINE

end of 1910. A light railway connects all four small mines with Machiakou. A standard branch line connects Machiakou with Kaiping station of the Imperial North China Railways.

CHOWKOCHWANG.—The Chowkochwang mine is situated about 10 miles east of Taoyuan and is at present the least important one of all. Three shafts have been sunk and three small steam winches of 50 tons capacity per hour each, seven steam boilers, workshops, store, water cleaning plant, offices, locomotive shed, truckscale and a steam mining fan of about 2000 cbyrds. capacity per min. have been installed. A steam driven shaft pump drains the mine at present and a second larger steam pump will be erected in the the near future. Chowkochwang has standard gauge connection with Kuyeh station of the Imperial North Chinese Railway.

At the end of 1910 the output of all the six mines together amounted to 1300 tons per day. The production of the mines may be brought up to 8000 tons per day, provided there is a market for such quantities.

All the mines are connected with the Administration Building in Machiakou by telephone and the latter has connection with the Imperial Railways of North China, the land department, and some factories in the neighborhood.

The management of the principal plant in Machiakou and the mine Yintsekou is directed by three German engineers. All other officials are Chinese. The technical management of the other four mines is wholly Chinese, the three German engineers acting as advisers only. The financial management of the whole concern lies in Chinese hands. With a view to extending the territory of sale the company intends to buy some seagoing steamers and lease a port on the coast of the gulf of Chihli. The erection of iron foundry works is also planned.

THE CHEE HSIN CEMENT CO., TONGSHAN

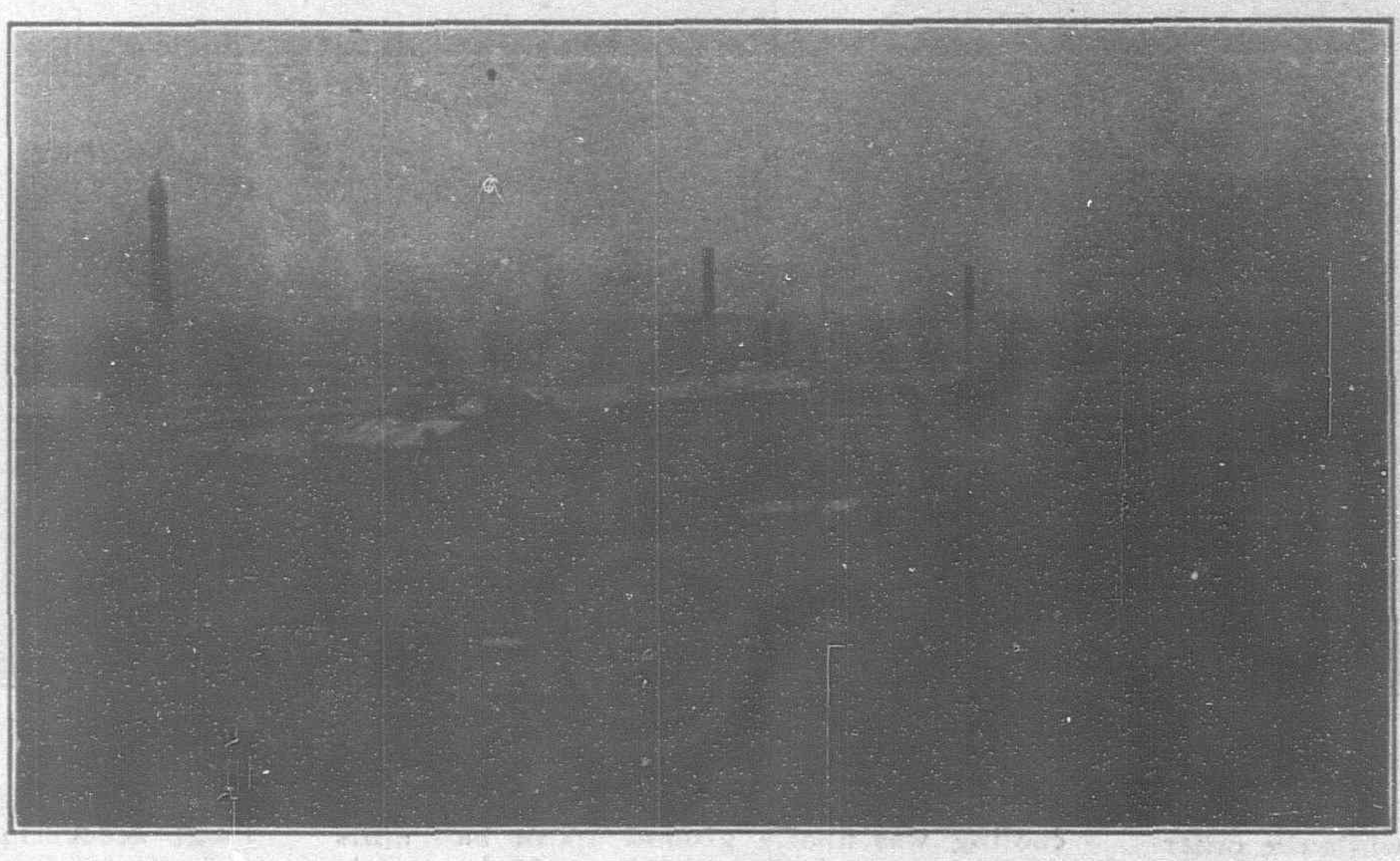
A review of the recent industrial development of North China would be incomplete without an account of the Chee Hsin Cement Company's plant at Tongshan. This company has been supplying cement and cement products to the railroad and public works of North China particularly to those in which Chinese capital is concerned. The plant is well situated, being close to the Imperial North China Railway.

The limestone quarries are beside the plant and the clay beds are located about 10 miles away on the railroad.

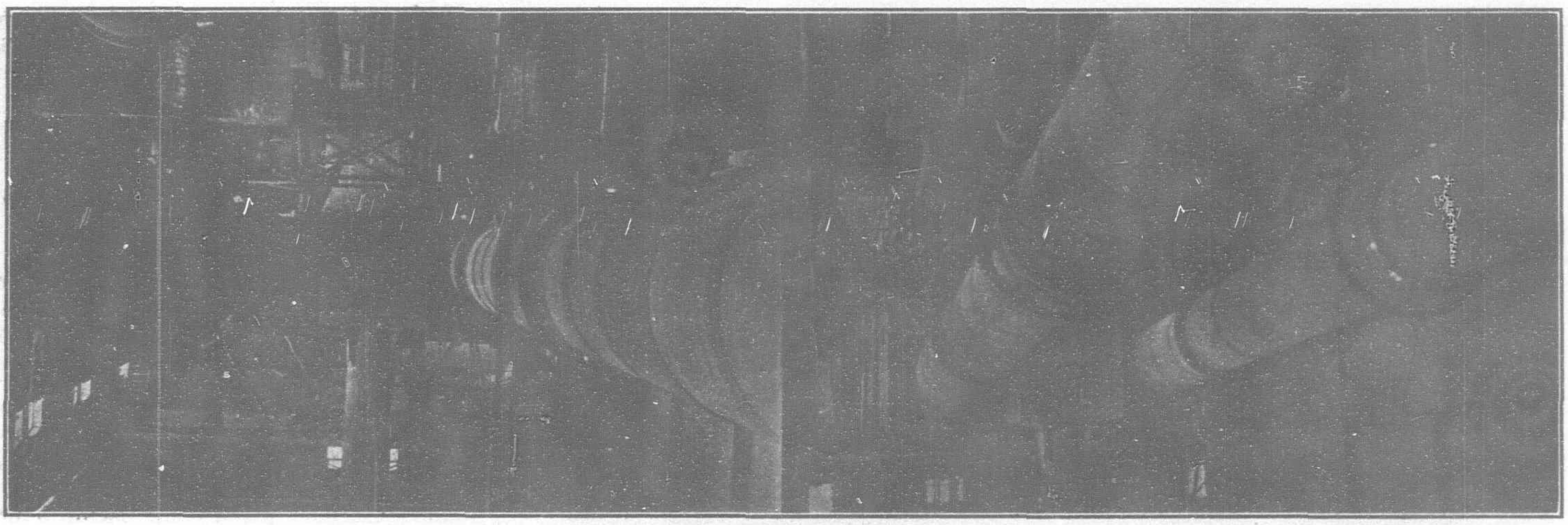
The company has now in course of erection a thoroughly modern cement plant involving an expenditure of $700,000 When completed, which will probably be in six months time, the company will be able to manufacture a half million barrels of cement per year, and the arrangement of the units in the present installation is such as to provide for an increased production when necessary. The new plant is already partly in operation while the old one is running at a reduced capacity and it is expected will be eventually discarded.

The old plant, while it has been turning out a cement answering in every particular the requirements of standard specifications, is not to be compared with the present up to date plants in efficiency of handling. Present practice in cement manufacture is far in advance of what it was 15 years ago, and involves a large saving in labor and time, a considerably greater economy in the use of fuel for the calciners and, what is of greatest importance, gives a final product that never varies in uniformity in the required physical and chemical properties.

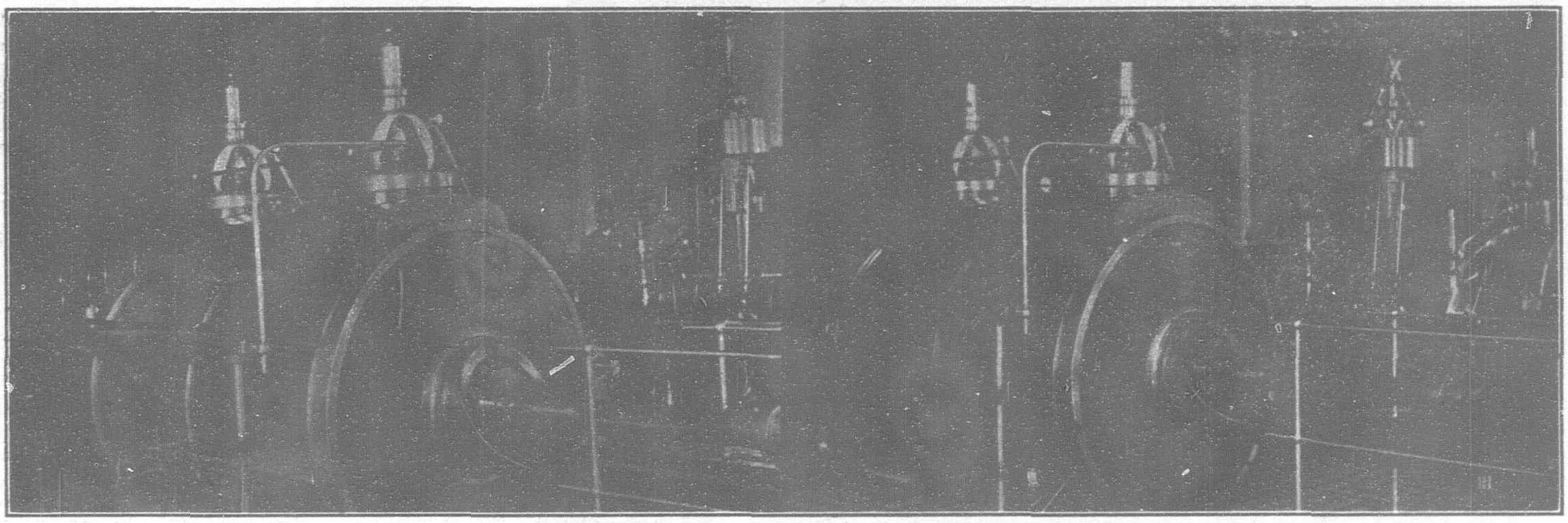
Contrast between the old and the new methods of manufacture is forcibly shown in a survey of the Chee Hsin Company's



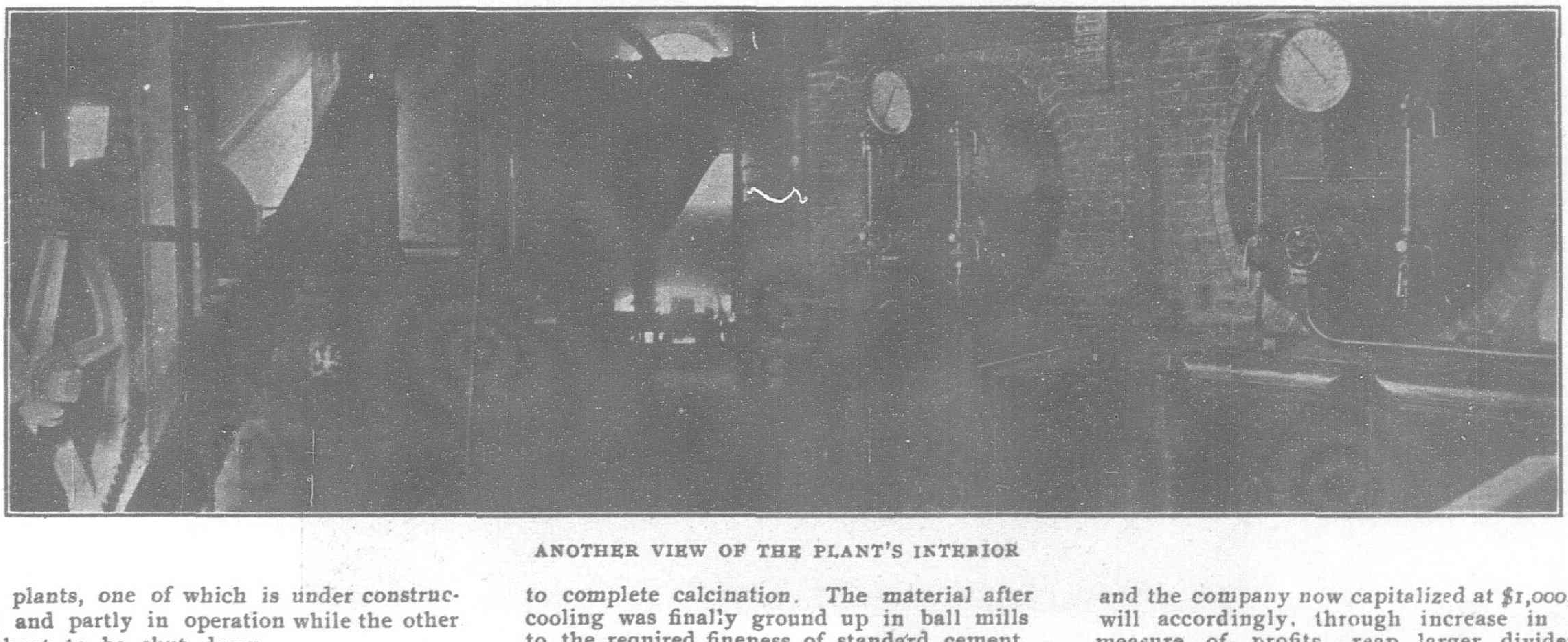
THE CHEE HSIN CEMENT PLANT AT TONGSHAN FROM PHOTOGRAPH TAKEN FEBRUARY, 1911



ROTARY OVENS INSTALLED IN THE CHEE HSIN CEMENT PLANT



INTERESTING INTERIOR VIEW OF THE CHEE HSIN PLANT



ANOTHER VIEW OF THE PLANT'S INTERIOR

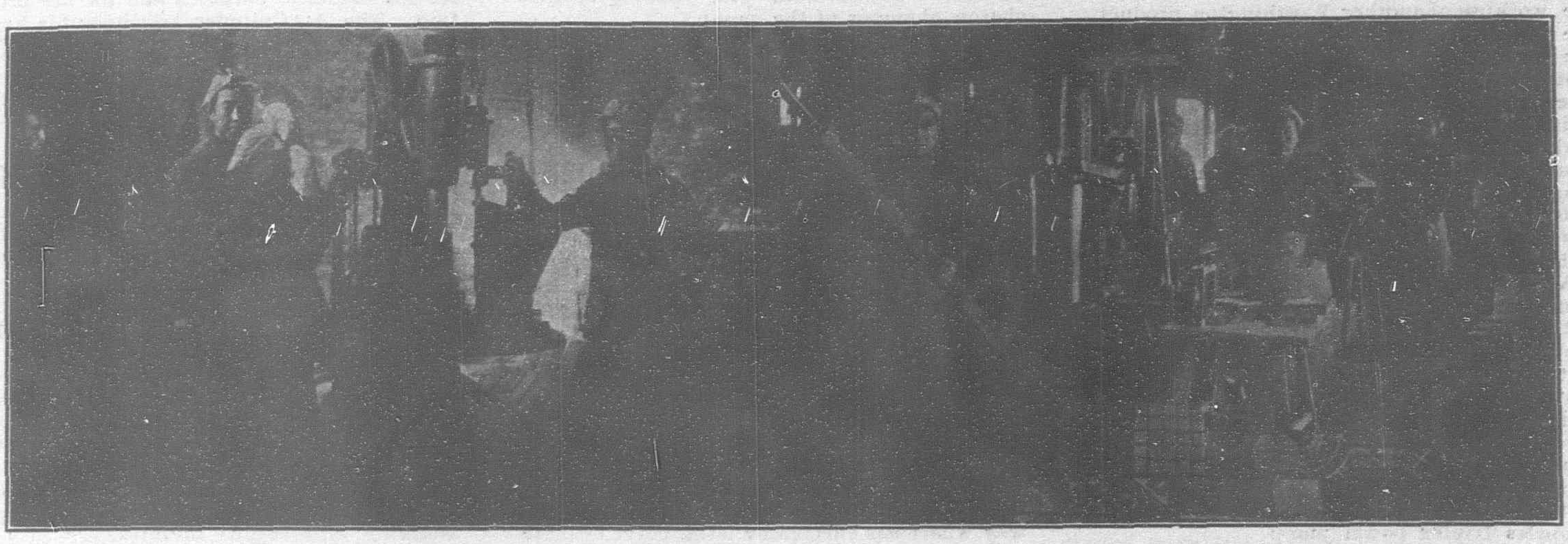
two plants, one of which is under construction and partly in operation while the other is about to be shut down.

The original plant was started in the year 1890, by Chinese capital employing an English engineer. In those days a large amount of manual labor did the work of the present improved mechanical contrivances. The limestone was dry crushed in blake crushers and revolving circular stone pulverizers. The material was then mixed with clay in the proper proportions, the whole being moistened and put together in the form of bricks. These bricks or blocks are then conveyed by coolies to a series of vertical brick drying and roasting kilns and the material heated to complete calcination. The material after cooling was finally ground up in ball mills to the required fineness of standard cement. This method of course was expensive and the company could not have successfully competed with other cement manufacturers in China were it not for the fact that being a Chinese concern, it naturally sold to the Chinese enterprises such as the Imperial railways of N. China, the Pekin-Kalgan line and various public works in Peking and other cities.

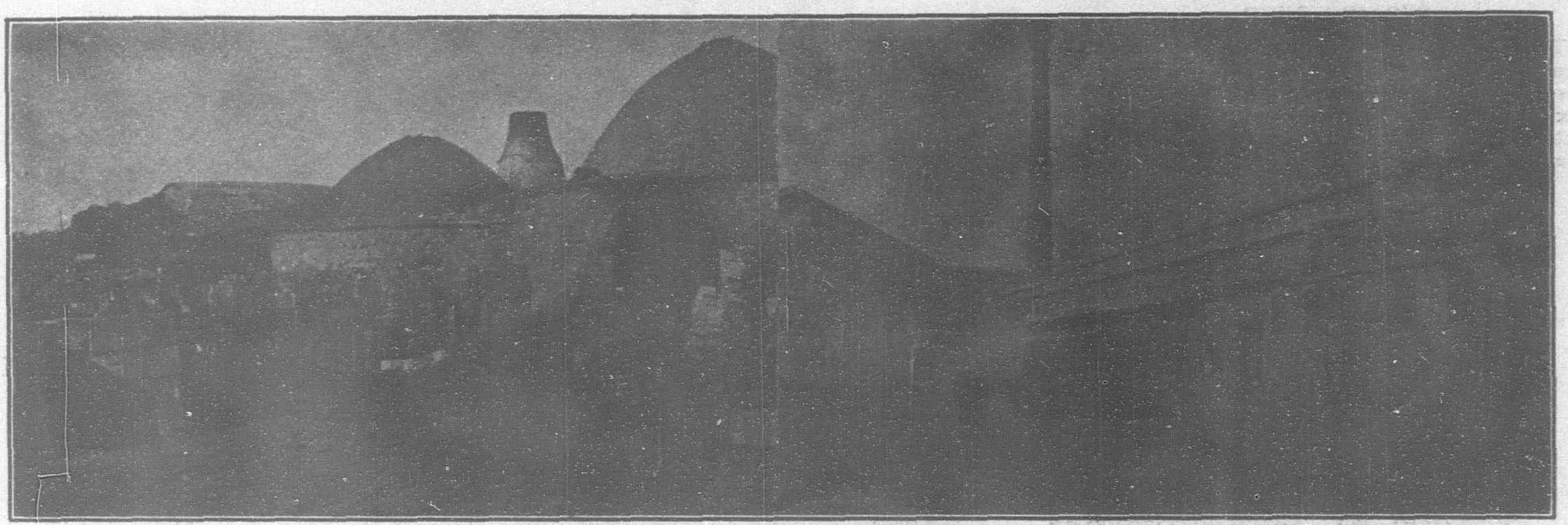
The plant has been taxed to its full capacity to meet the demands of the present building operations, the output for 1910 having reached the maximum figure of 230,000 barrels. There will be a greatly increased demand for cement from the present outlook, and the company now capitalized at $1,000,000 will accordingly, through increase in the measure of profits reap larger dividends than heretofore.

It is also expected that by the combination of increased plant efficiency and transportation facilities, sales will naturally be increased over a far wider territory.

In contrasting the old with the new plant we note two chief features that account for the perfection that has been attained in modern cement manufacture, i. e. (1) fine grinding by means of a tube mill, (2) the use of horizontal rotary calcining kilns. There are also many other improvements in the accessory mechanical devices for economical handling which is in line with the



DEPARTMENT OF THE CHEE HSIN CEMENT CO.'S PLANT WHERE TILES ARE MANUFACTURED



OTHER VIEWS OF THE CHEE HSIN CEMENT COMPANY

progress in similar operations in other industries.

Formerly fine grinding was done in some type of rolls or German ball mills, the latter being a cylindrical horizontal type containing a quantity of spherical "diameter balls" by which the grinding was done. A current of air was used to blow off the fine material as it is produced in order to facilitate more rapid and uniform grinding.

The new mill of the Chee Hsin works is provided with tube mills in place of ball mills. These are also cylindrical but much larger than the ball mills, being 25 ft. or more in length. Each mill contains 10 tons of flint balls that roll against each other to produce the grinding action. The lining of the cylindrical shell is also of flint so that there is no wearing away of iron parts to pass into the cement.

The success of the tube mill is shown in its comparatively recent adoption in all the cement manufacturing plants of the world. Another improvement that marks the greatest difference between modern and the former's practice is the use of the horizontal revolving roasting kilns. In the new Chee Hsin plant there are now two of these in operation and two more in process of erection. They are 35 meters in length and have a capacity of 50 tons of material roasted or "cintered" per day. These kilns will replace 20 or more of the crude vertical kilns now in operation.

The new method is automatic and continuous in operation while in the old method the process was carried on entirely by hand and was intermittent, thus being wasteful of fuel and time on account of the necessary alternate cooling and heating of the kilns.

Another feature of the plant is the absence of dust in the grinding rooms, so common to most cement plants. This is because of the new practice of wet crushing instead of dry. The material, after coming from the coarse preliminary crushers, is conveyed to large cylindrical vats where the pulp is thoroughly agitated with water before passing to the tube-mills for final grinding.

The new plant covers 30 acres of ground, and has storage room for 100,000 barrels.

Besides cement, the company is also prepared to manufacture on a large scale, bricks, common and fire-clay, and various clay and special cement products such as flooring, roofing and paving material. Electrical power will be used entirely, a thousand H. P. generator set now being in process of erection. The machinery to be used is of German and Danish manufacture.

OPENING OF THE NEW YORK ARCHITECTURE AND BUILDING SHOW

The Architecture and Building Show, which opened in New York, May 19, has the distinction of being the first to be held in the New Grand Central Palace. Incidentally the building itself is a prominent and appropriate exhibit, since the public is getting its first glimpse of the interior, and what is most remarkable is that this magnificent structure, thirteen stories high, occupying an entire block on Lexington Avenue from Forty-Sixth to Forty-Seventh Streets, directly over the underground tracks and yards of the Grand Central Terminal, was built and practically completed, except for the remaining interior finishing on the upper floors in the record time of eight months and eighteen days. The contractors, James Stewart & Co., erected all of the steel work at night and the whole construction was carried out without interfering in the slightest with the regular schedules of the trains of the New York Central and New Haven roads running beneath it.

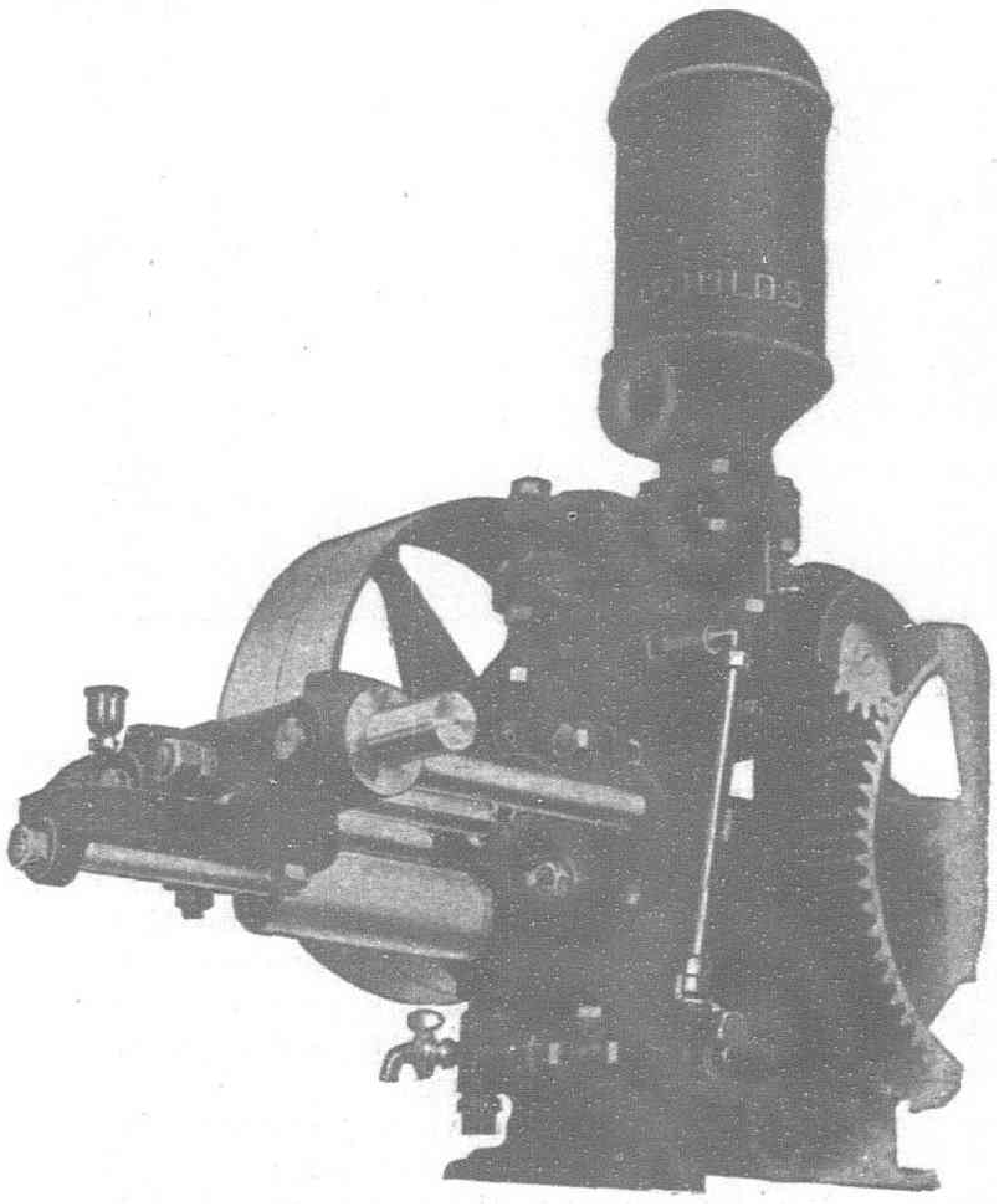
Among the exhibits that are of especial interest is the combined one of Henry R. Worthington, the Blake & Knowles Steam Pump Works, the Laidlaw-Dunn-Gordon Company and the Deane Steam Pump Company. Occupying the center of the space is one of the few operating exhibits to be seen at the show. It is a type A open pattern liquid weigher, a recent product of Henry R. Worthington, particularly developed for accurately measuring and recording by either weight or volume, the flow of hot water, chemicals, oils and other liquids that cannot be satisfactorily measured by meters. Briefly and simply described it consists of two tanks placed side by side and supported on knife edges so that they may be readily tilted a limited extent. When empty the tanks stand level but after a certain quantity of water is admitted alternately to each tank it becomes top heavy and tips over allowing the water to escape through a bent pipe establishing a siphoning action that continues after the tank settles back to its normal or horizontal position until the tank is completely drained. Meantime the other tank is filling, for the instant that one tank tips the flow of water into it is automatically switched to the other tank. With this continued alternate filling and emptying of the tanks and always involving the same definite quantities of the liquid, it but remains to count the movements of the tanks which is done by an automatic counter, made to read directly in either pounds or gallons.

In this exhibit, to use the same water over repeatedly, and at the same time demonstrate the working of another Worthington product, the water from the receiving tank into which the weigher discharges is returned by a small motor-driven centrifugal pump to an elevated reservoir from which the water flows into the weigher. In this instance the reservoir is a Blake & Knowles open feed water heater for steam boilers, and while it is not used as in practice, there being no steam available to pass through it to heat the water, it does show the automatic valve control of the feed water flow.

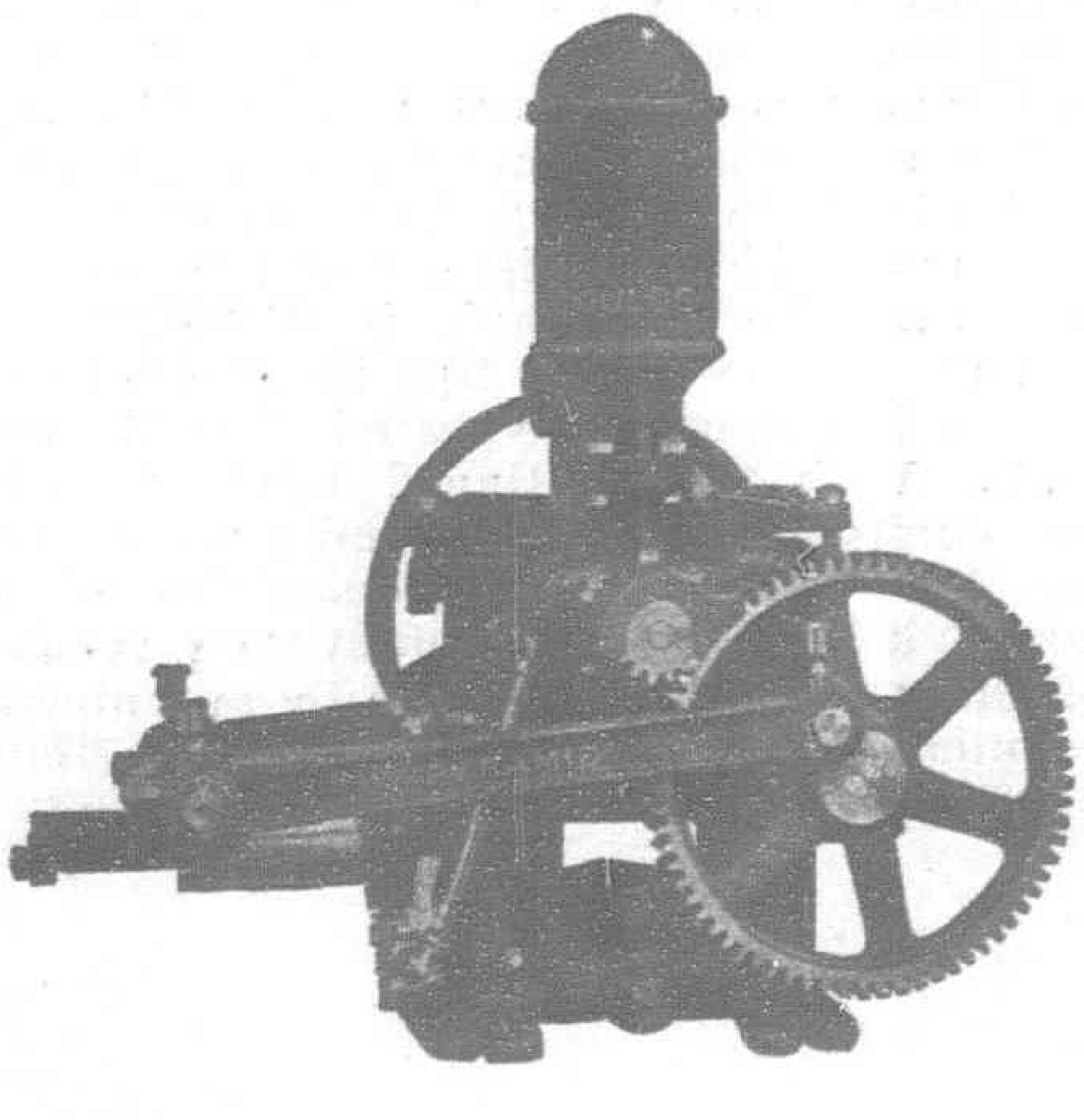
A striking thing about the little centrifugal pump, which is only 12 inches in diameter, but has a capacity of 30 gallons a minute is that it is so quiet and smooth running that it takes pretty close inspection to discover that it is really in operation. In fact, when it is running a dime may be stood on any level part of the pump without falling, showing the complete absence of vibration. Examples of the different types of Worthington meters are also exhibited and a motor driven Knowles triplex power pump.

GOULDS AIR CYLINDER FOR PUMP PYRAMID PUMP

The Goulds Manufacturing Company of Seneca Falls, N. Y., are placing on the market a special Air Cylinder for attaching to sizes 3 x 5 and 4 x 5 of their "Pyramid" Double-Acting Piston Pump when used for Pneumatic Water System Pumping.



This Air Cylinder does away with the necessity of a separate pump for maintaining the required air pressure in pneumatic tank systems. It is designed to operate against a pressure of 75 which is the maximum rating for the "Pyramid". Opening the air cock prevents the air from going into the tank and relieves the pump of all pressure when not required. Suction, discharge valves and cylinder are brass. Plunger is leather cupped, packed and operated by piston rod of pump. The cylinder bracket is rigidly held in place by the same bolts that hold the cylinder head. The design and manner of attachment makes this the most complete outfit on the market.



The pipe leading from the air attachment is connected to the drain plug opening or discharge chamber of the pump.

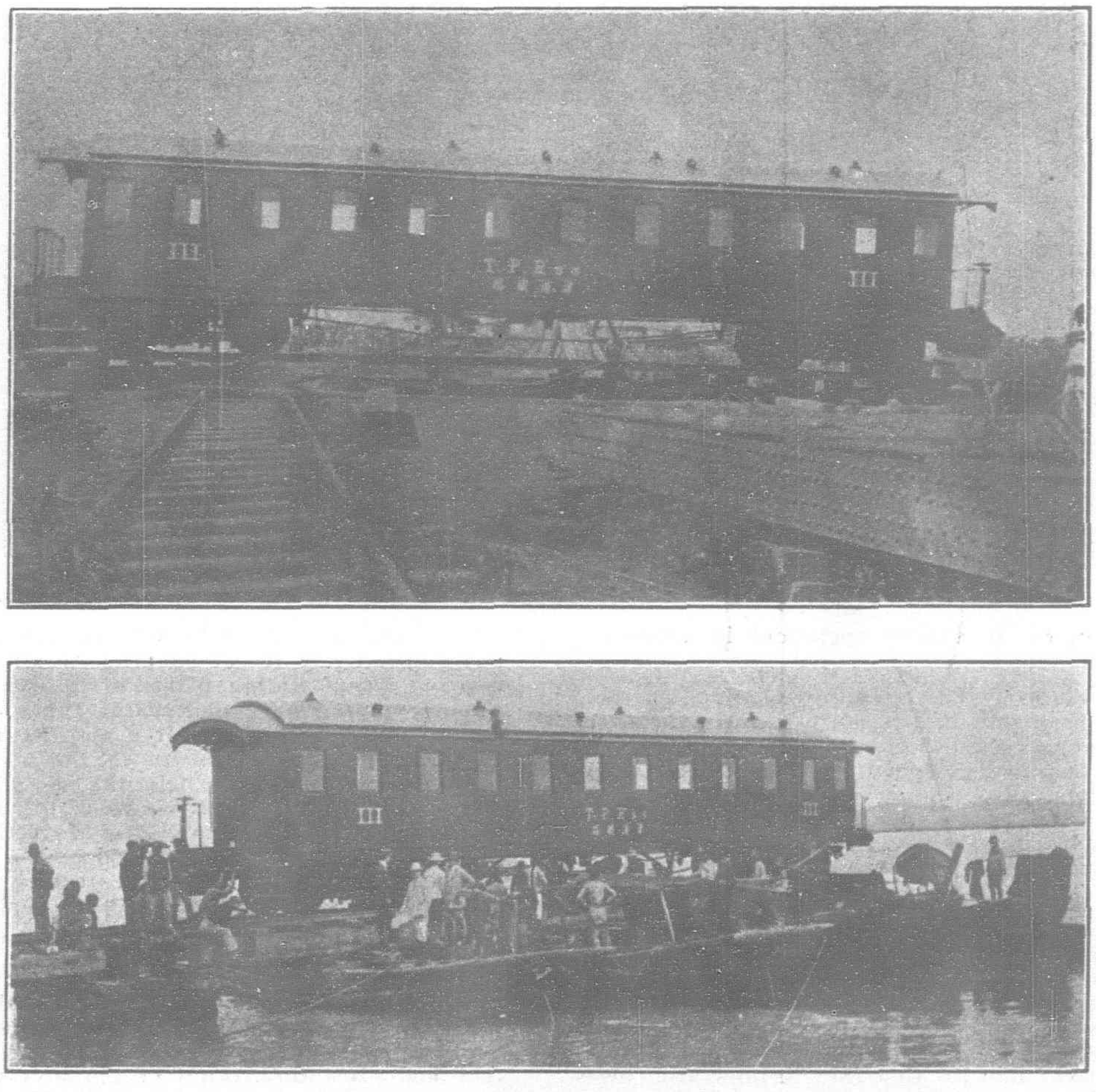
Where this attachment is used with the "Pyramid" Pump for supplying pneumatic tank systems it is possible to have running water throughout the house, stable or yard for all domestic purposes and for fire protection. The Air Cylinder attachment is known as Fig. 1567. The manufacturers will be pleased to forward complete circulars and prices to anyone upon application.

Coaches Built at the Woosung Shops for the Tientsin-Pukow Railway

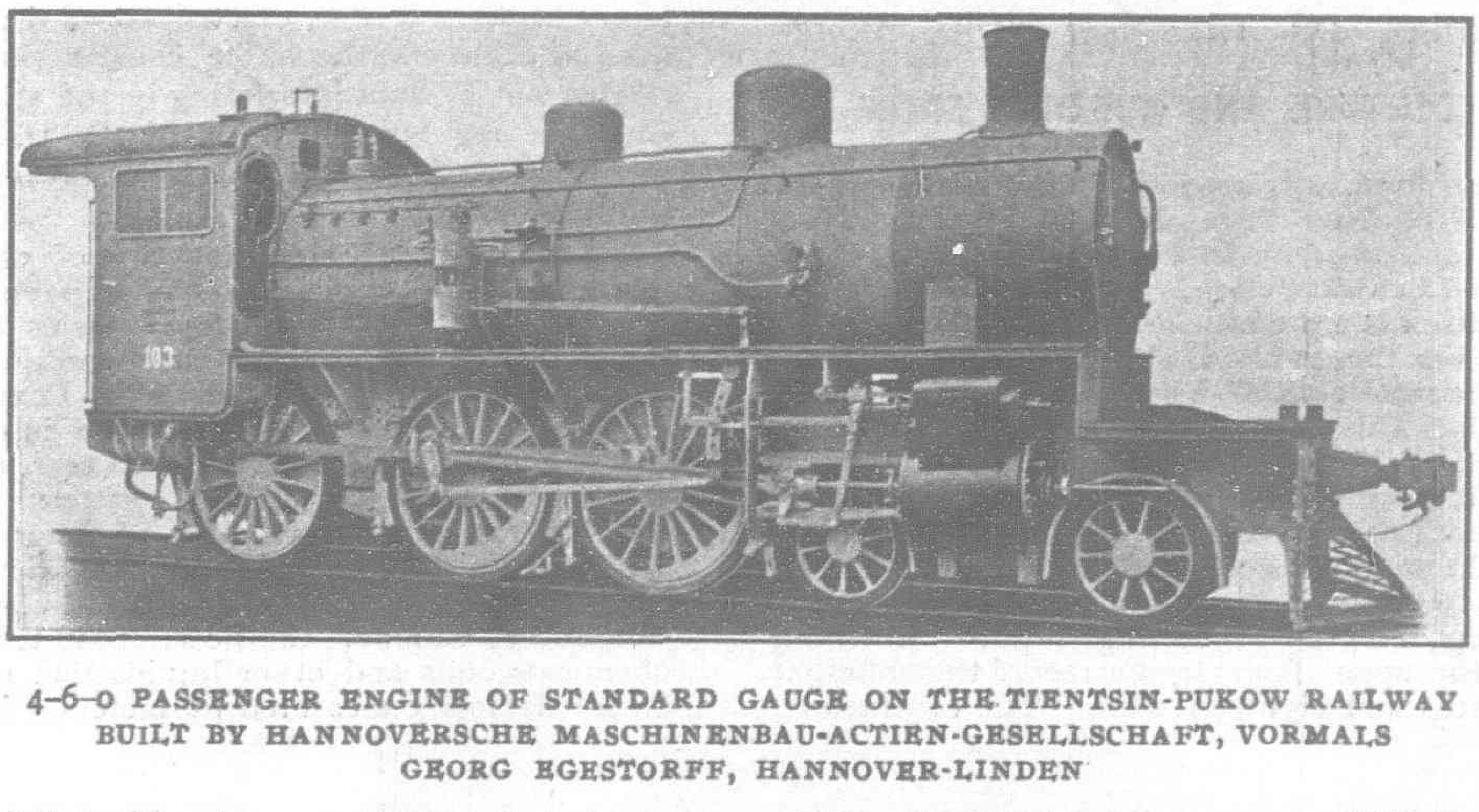
The accompanying illustration is from a photograph of the first of nineteen coaches being built at the Woosung Shops of the Shanghai-Nanking Railway. The first delivery included four coaches similar to the illustration and were transhipped across the Yangtsze on their own wheels, being the first time a coach has been taken acrosss water in China ready for the rails.

The water transportation across the river to Pukow from the Shanghai-Nanking Railway wharf was effected by lashing five Chinese junks together and leveling the tops with two 68' × 14". Oregon pine logs laid across, and on top of this construction the sleepers and rails were placed.

The temporary ferry thus constructed was then brought alongside the Shanghai-Nanking Railway Wharf and connected up with the wharf track so that the coaches were pushed on board by hand. Then the wheels were "scotched," etc., and the freighted ferry towed across to Pukow, joined up to the Tientsin-Pukow Railway track and the coaches run off by hand. These coaches were landed on the Tientsin-Pukow rails from the Shanghai-Nanking rails in fifty minutes. Two coaches were transferred on June 15 and three on June 23.



VIEWS OF COACHES BUILT AT WOOSUNG SHOP FOR THE TIENTSIN-PUKOW RAILWAY ON THE RAILS AND ON THE FERRY



4-6-0 PASSENGER ENGINE OF STANDARD GAUGE ON THE TIENTSIN-PUKOW RAILWAY BUILT BY HANNOVERSCHE MASCHINENBAU-ACTIEN-GESELLSCHAFT, VORMALS GEORG EGESTORFF, HANNOVER-LINDEN

Cylinder Diameter. . .	21.2 ins	Grate Area , . . .	28.0 sq. ft.	Weight empty	137000 lbs.
Stroke of Piston . . .	24.8 ,,	Heating Surface . .	2090 ,, ,,	Adhesion Weight . . .	106500 ,,
Driving Wheel Diameter	68.9 ,,	Working Pressure .	85 lbs.	Weight in Working Order	153500 ,,

AMERICAN STEEL FRAME BUILDINGS ABROAD

NOTABLE ACHIEVEMENTS OF THE UNITED STATES STEEL PRODUCTS EXPORT COMPANY

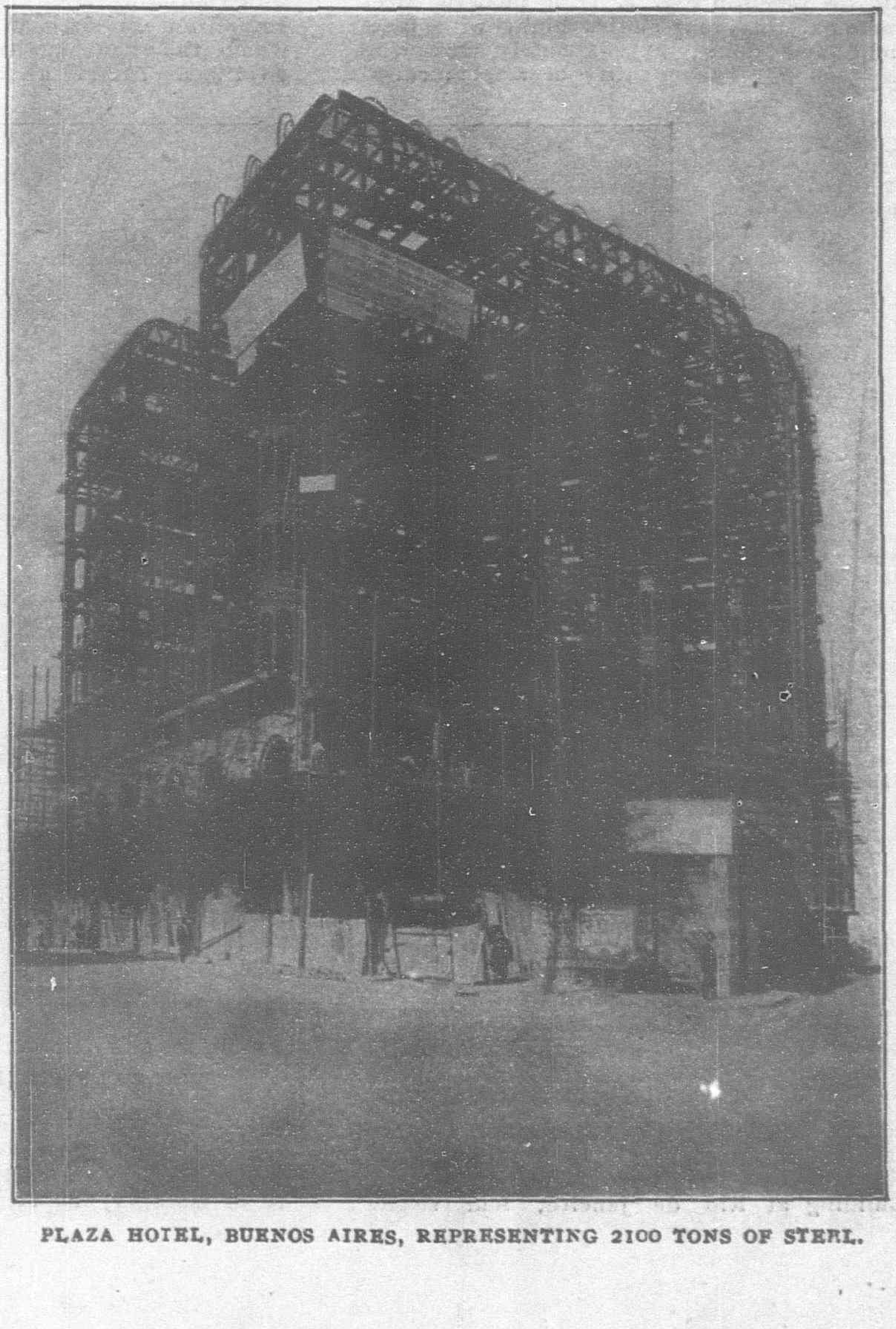
MONROE PEACE PALACE, RIO DE JANEIRO, BRAZIL, APPROXIMATELY 400 TONS.

A conspicuous example of the important work that is being done in foreign countries by American manufacturers is the construction, and in many cases the erection, of steel frame buildings, says the *Iron Age*. It is generally known that American manufacturers have undertaken contracts for some of the largest bridges in the world, and that the United States Steel Products Export Company recently supplied the whole of the bridges for the South Manchurian Railway and for a number of other important railroad projects in the Far East, Mexico, South America and elsewhere.

It is probably, however, not generally known that there is a steady development of a demand for steel buildings of American design throughout the world. While these buildings have not as yet assumed the proportions of the American skyscraper, the tendency of development is in that direction, and it is probable that within a few years an increasing number of large buildings of American design will be erected in the principal cities of the world. A recent example is the Phoenix Hotel at Buenos Aires, which an accompanying illustration, Fig. 1, shows in process of erection. This is the first modern fireproof building in Buenos Aires, and is, furthermore, the largest and highest building in that city. It consists of nine stories, the maximum hight from the level of the sidewalk, being 63 m. (about 207 ft.), with a frontage on San Martin square of 60 m. (about 197 ft.) and a depth of 57 m. (about 187 ft.). The contract for the steel work was taken by the Buenos Aires branch office of the United States Steel Products Export Company, and the material was fabricated and furnished ready for erection by the American Bridge Company, the total quantity of steel amounting to 1800 tons. The erection of this hotel resulted in a further important development in the shape of steel construction apartment houses, of which a number are now under way in Buenos Aires.

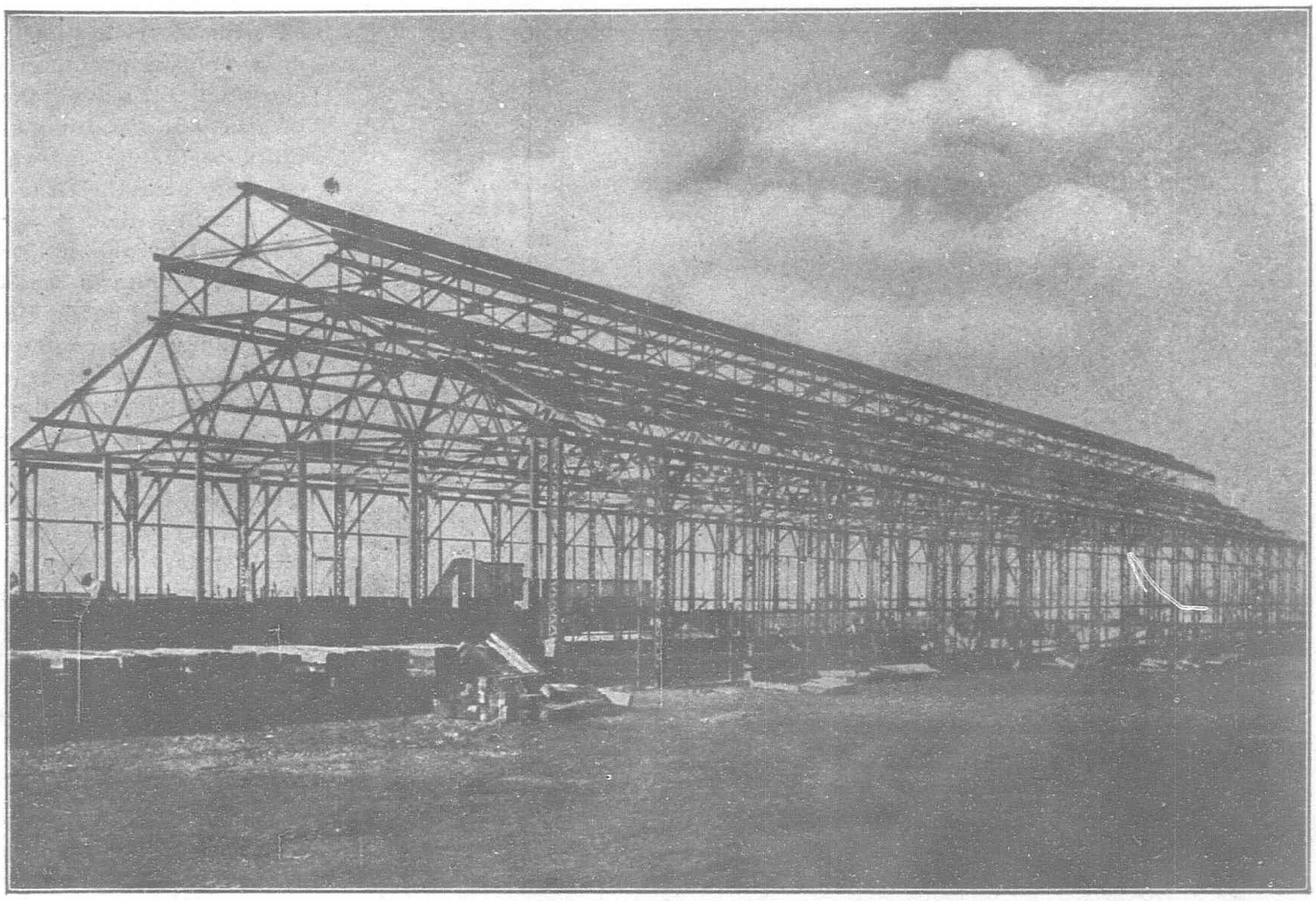
In the early stages of the development of the American skyscraper, American methods of steel building construction were not regarded with favor by foreigners. Many of the most notable examples of the new style of construction, while possessing the advantages of size with resulting economy and adaptability to the uses for which they were designed, were nevertheless of a type of architecture so unsightly that it would not have been tolerated in the old cities of the world. Foreign architects whose ideas were in favor of buildings of moderate hight, and who were also obliged to conform to laws restricting the hight of buildings (such as, for instance, the English laws relating to "ancient lights"), viewed with distrust the comparatively light skeleton designs of American steel work. Time has, however, demonstrated the strength and safety of this form of construction, and the constant increase in the value of land in the large cities of the world has compelled an increase in the hight of buildings, thus removing one of the principal obstacles to the development of American steel construction, and the pioneer work of American architects and engineers in foreign countries is beginning to yield substantial returns.

Other important examples of American building construction, although not of the skyscraper type, are the two buildings at Rio de Janeiro, also shown in accompanying illustrations, for both of which the steel work

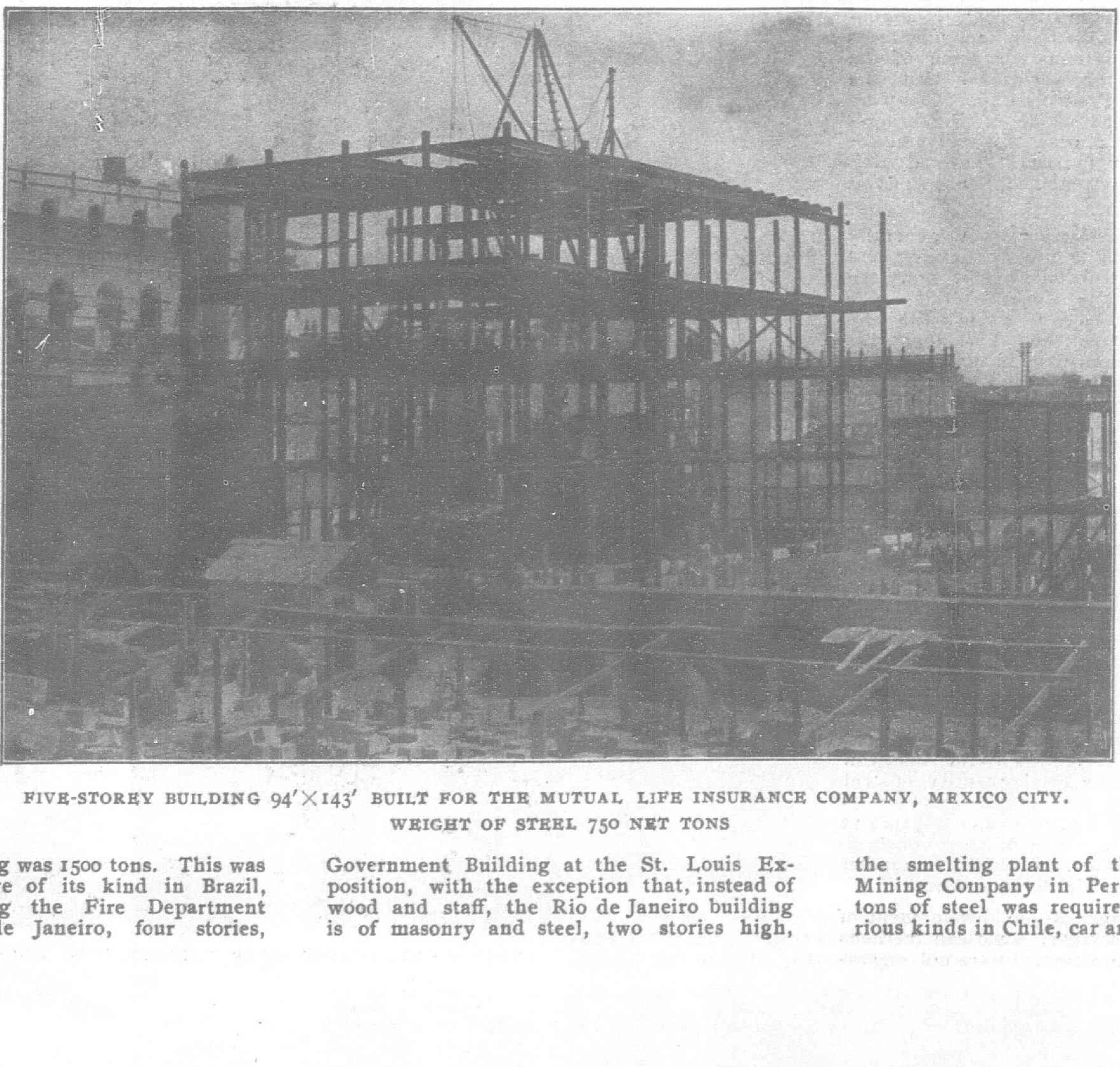


PLAZA HOTEL, BUENOS AIRES, REPRESENTING 2100 TONS OF STEEL.

was sold by the United States Steel Products Export Company and manufactured by the American Bridge Company. One of these buildings, the artistic National Library of Rio de Janeiro, Fig. 2, is a modern steel frame building, four stories high, with basement and dome, approximately measuring 100×208 ft. The quantity of steel furnished for this building was 1500 tons. This was the second structure of its kind in Brazil, the first one being the Fire Department Building at Rio de Janeiro, four stories, with a central dome eight stories hich, which was also furnished by the American Bridge Company through the United States Steel Products Export Company. The other building of which an illustration is given, Fig. 3, is the Exposition Building at Rio de Janeiro, in which the Pan-American Congress held its meetings. This is an exact duplicate of the Government Building at the St. Louis Exposition, with the exception that, instead of wood and staff, the Rio de Janeiro building is of masonry and steel, two stories high, with a dome, the main section occupying an area of 90×120 ft.

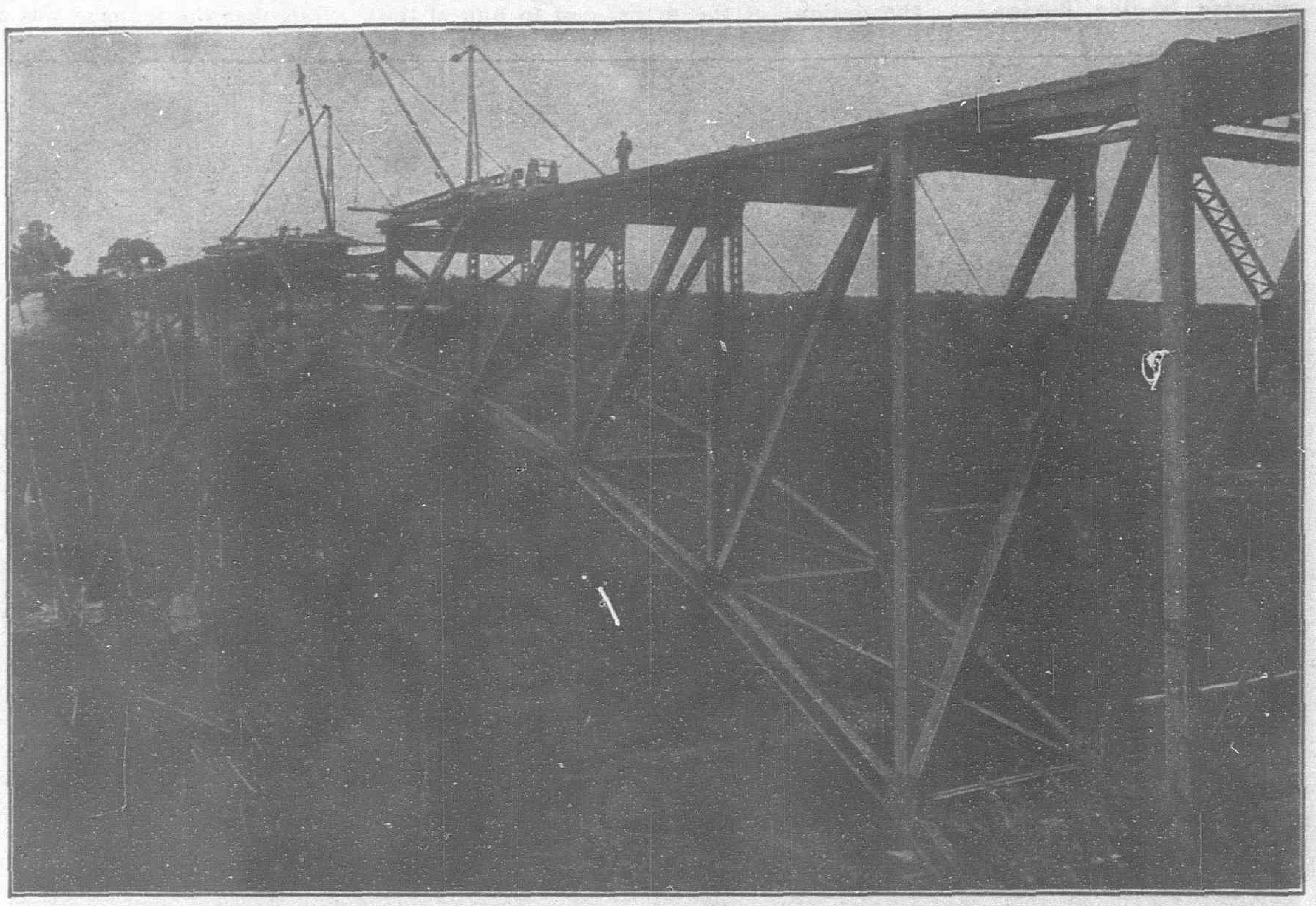


CAR BARN AT KALGOORIE, AUSTRALIA, 300′×60′ WEIGHT OF STEEL 110 TONS



FIVE-STOREY BUILDING 94′×143′ BUILT FOR THE MUTUAL LIFE INSURANCE COMPANY, MEXICO CITY. WEIGHT OF STEEL 750 NET TONS

As a result of the efforts and organization of the United States Steel Products Export Company American steel building construction is being rapidly developed throughout the whole of South America. Other important contracts secured by this company include the smelting plant of the Cerro de Pasco Mining Company in Peru, for which 4000 tons of steel was required; buildings of various kinds in Chile, car and factory buildings



ARCH SPAN, CAMBRIDGE, NEW ZEALAND 1 290-FT. ARCH SPAN, 2 65-FT. GIRDER APPROACH, 1 42-FT. GIRDER APPROACH.—APPROX. 345 TONS.

4 200-FT. SPANS, TAIWAN RAILWAY, OVER RIVER NEAR TAIPER CITY, JAPAN.—WEIGHT 660 TONS.

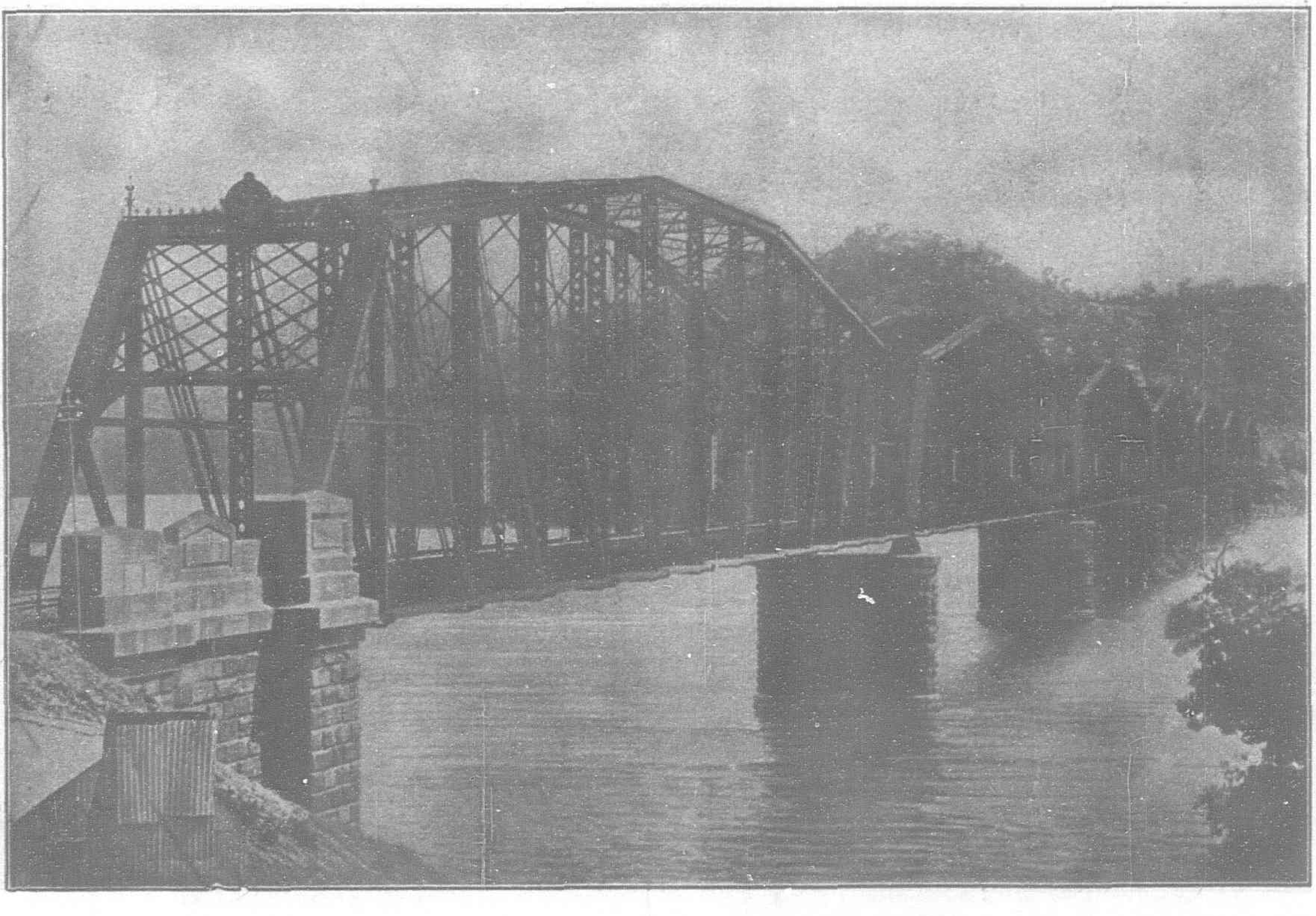
in the Argentine Republic, warehouses in Paraguay, power houses in Peru, power plants in Brazil, railroad and highway bridges in Peru, Colombia, Argentina, Ecuador, Brazil, Bolivia and Uruguay.

Considering the engineering difficulties to be overcome in building bridges over gorges, canyons, rivers and valleys in far distant countries, where the facilities for transportation and erection are frequently of the most primitive character, the fact that American exports of steel bridges and structural work have already become one of the most important branches of our foreign trade, even from the point of view of tonnage, is highly creditable to the enterprise of American manufacturers and of the distributers of their products in foreign markets.

Not least among the difficulties to be overcome was the fact that a large majority of the engineers and architects in the countries in which this development is taking place were trained in Europe, and are therefore accustomed to regard European practice as standard and to distrust any departure from it. In such cases it has been necessary to convince them not only of the economy of American methods and standards, but also of their safety and practicability.

One feature of the organization of the United States Steel Products Export Company, the necessity of which soon developed was the establishment at important points of a complete engineering and technical staff, capable of designing steel structures to meet the local requirements, of submitting estimates of cost of erection and of carrying out the actual work of erection under local conditions. In other words, the representative of the United States Steel Products Export Company at these leading foreign points is in a position to make a bid on the erected work, and for that bid needs nothing more from the home office than a cabled c. i. f. price on the material. The foreign engineering office receives at frequent intervals detailed costs of fabrication from the American Bridge Company as a guide in figuring, subject to local conditions. The foreign customer therefore need not wait for the passing to and fro of estimates for material, and is not called upon to figure freights or any details whatever. He receives a straight bid, with the design, of the actual cost to him of the erected structure, terms of payment being arranged locally in the funds of the country, all the correspondence being conducted, as is the rule of the United States Steel Products Export Company, in the language of the customer, whose views, it will be observed, are met to the last detail. It was found that this was the wisest course to adopt in developing this business, particularly since the disposition of European competitors was to make a low price per pound of material, but to submit designs cumbersome in character, so that the tonnage was considerably greater and the final cost to the user larger. It has been the aim to convince the customer that the final structure, meeting all his requirements, is put in place, by American design and methods of erection, at a lower ultimate cost to him than the proposals of rivals which may appear more advantageous on the basis of a fallacious low per pound price for the material alone.

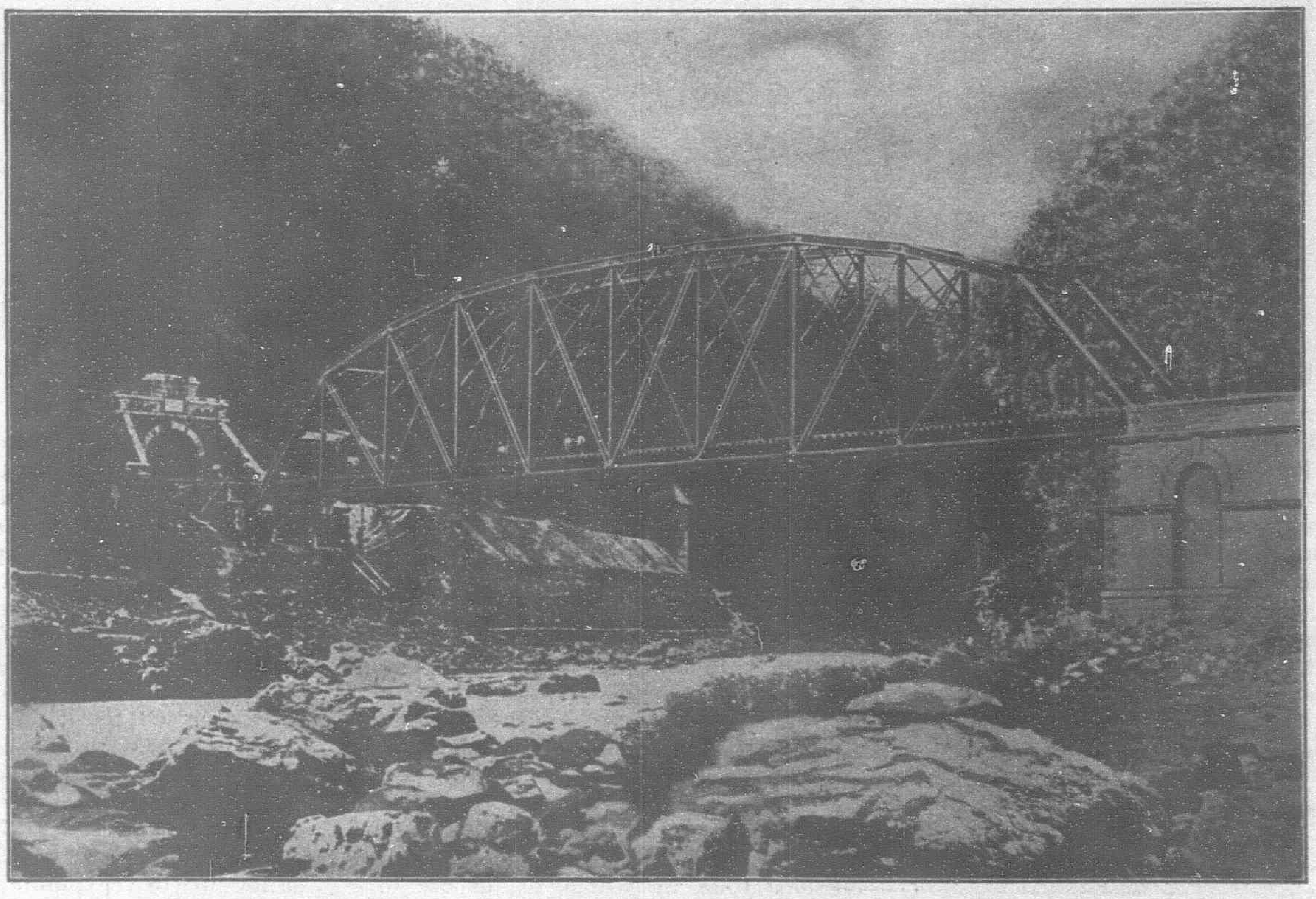
GOVERNMENT RAILROAD BRIDGE OVER WOLLONDILLY RIVER, AUSTRALIA.—TWO LATTICE TRUSS SPANS, EACH 120 FT. LONG WITH PLATE GIRDER. APPROXIMATE WEIGHT 220 TONS



BRIDGE OVER HAWKESBURY INLET IN AUSTRALIA.—7 D. T. THROUGH PIN CONNECTED SPANS, EACH 416 FT. LONG

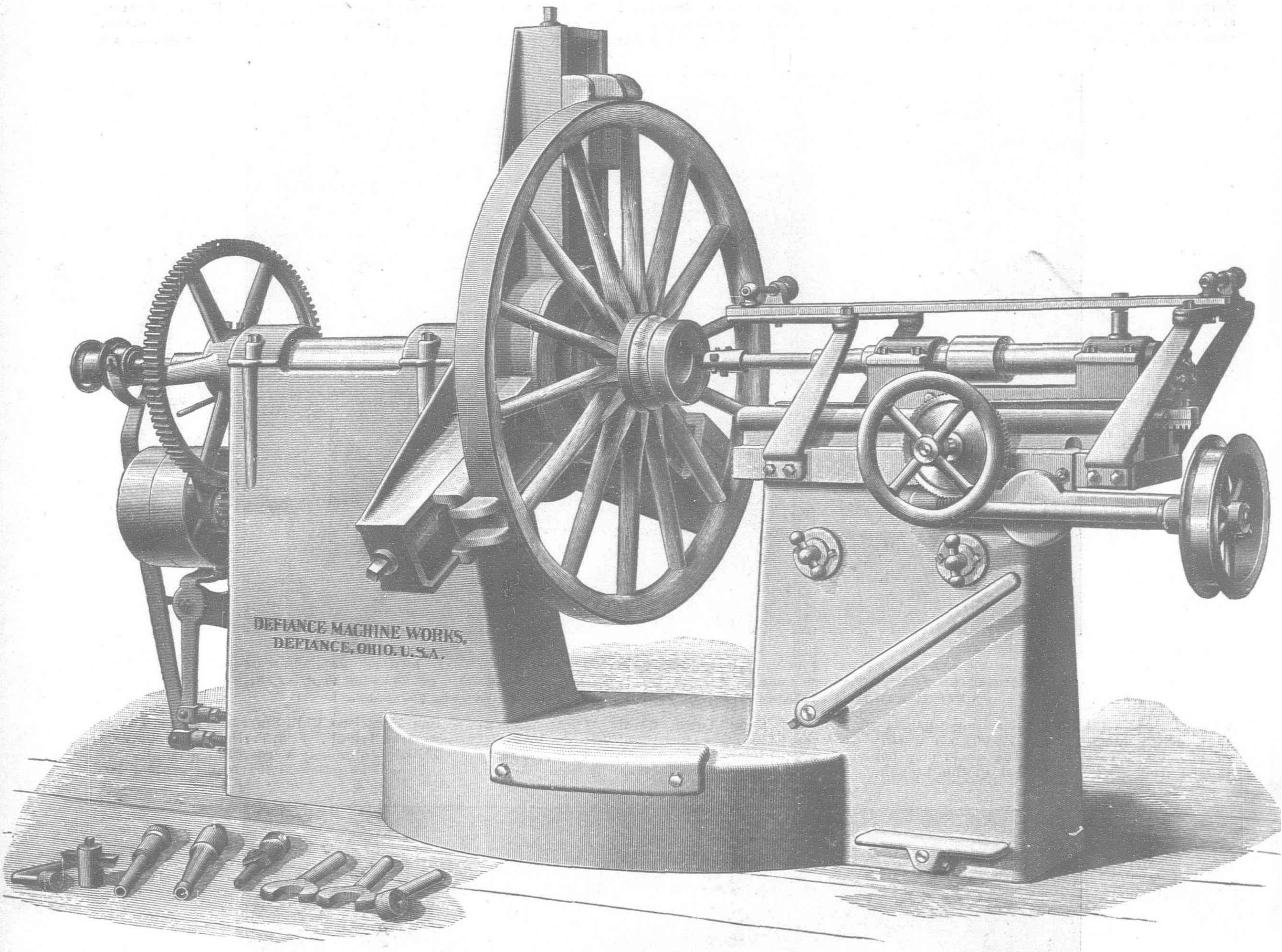
BRIDGE OVER ATBARA RIVER IN EGYPTIAN SOUDAN—SINGLE TRACK RAILROAD BRIDGE, COMPOSED OF 7 PIN CONNECTED THROUGH TRUSS SPANS. EACH 147 FT. LONG.—WIDTH C TO C OF TRUSSES 16 FT. 2 INS. DEPTH C TO C OF CHORDS, 21 FT. 6 INS. WEIGHT OF STEEL WOORK, 760 TONS.

The United States Steel Products Export Company now has an engineering organization at Buenos Aires, Argentine Republic; Valparaiso, Chile; Sydney, Australia, and Shanghai, China. How completely the selling organization, which handles over $50,000,000 worth of business a year, covers the world may be judged from the following list of the branch offices, some of which are effective aids in the important purchases of raw materials, notably tin, which this subsidiary of the United States Steel Corporation handles: London, E. C., England; Antwerp, Belgium; Montreal, Canada; Buffalo, N. Y. (for Province of Ontario); Mexico City, Mexico; Sydney, N. S. W. Australia; Johannesburg, South Africa; Cape Town, South Africa; Buenos Aires, Argentine Republic; Rio de Janeiro, Brazil; Lima, Peru; Shanghai, China; Yokohama, Japan; Batavia, Java; Aleppo, Syria; Alexandria, Egypt; Barcelona, Spain; Beyrouth, Syria; Bombay, India; Cairo, Egypt; Calcutta India; Christiania, Norway; Constantinople, Turkey; Copenhagen, Denmark; Genoa, Italy; Limassol, Cyprus; Mersina, Turkey; New Orleans, La.; Piraeus, Greece, Portland, Ore.; Rotterdam, Holland; St. Johns, Newfoundland; St. Paul, Minn. (for Manitoba); San Francisco, Cal ; Smyrna, Turkey; Trieste, Austria; Tripoli, Syria; Turin, Italy; Vancouver, British Columbia; Varna, Bulgaria.



HODSU RIVER BRIDGE, KYOTO RAILWAY, JAPAN.—ONE THROUGH PIN CONNECTED TRUSS SPAN, 280 FEET LONG—WEIGHT 230 TONS.

It will be observed that while a great lead has been accomplished in the past few years the broad foundations have been laid for a much more extensive and important development in the near future.



AUTOMATIC WHEEL BOXING MACHINE

AUTOMATIC WHEEL BOXING MACHINE

The No. 1 Automatic Wheel Boxing Machine manufactured by the Defiance Machine Work, Defiance, Ohio, as shown by the accompanying engraving is used by the principal wagon and carriage builders for boring the wheel's hub for the reception of the box.

It is calculated to bore and finish the hole at one cut to any shape regular or irregular in form to suit the shape of the box to be used therein, relieving the center of the hub around the spokes, and cupping both ends of the hub to any desired shape.

All this is performed at one starting and stopping, and 600 wheels can be fitted complete in ten hours. It is calculated to perform either light carriage and spring wagon work or heavy work for farm wagon, truck and artillery wheels.

It possesses every convenience of operation, is thoroughly durable, and unusually well adapted to rapid and accurate work.

The cored frame is cast in one piece and is heavy and substantial throughout, care having been taken in every way to secure a machine that will not spring, jar or chatter when performing the heaviest class of work.

The chuck is universal and fitted to a 6″ spindle. All the dogs are actuated simultaneously, by turning with a wrench any one of the three screw heads, opening and closing them to receive wheels from 20″ to 60″ diameter.

The boring bar of hammered steel 2 1-2″ diameter makes 4,000 rotations per minute, has lateral and longitudinal adjustments to enable it to bore holes of any taper, size or contour desired, and is provided with auxiliary cutter-heads to perform the depthing at back of hubs to accommodate the shoulder of axle. The several operations of the boring bar or spindle are automatic. After completing the cut the feed is disengaged automatically, thus leaving the operator a few seconds' time in which to dispose of his finished and unfinished wheels.

The contour of the axle box to which the wheel is bored is faithfully followed by an automatic device which relieves the operator of all care and attention.

The boring cutter is of the most improved kind, consisting of three independent cutters of square tool steel, which are easily replaced when worn out at small expense.

The wheel is rotated at 50 turns per minute and the cutters at 4,000 turns.

The operator has complete control over the machine from the working side, the chuck and all other rotating parts of the head stock can be set in motion or arrested by a combination of shipper and brake by a single movement of the foot of the operator.

The machine is made with unusual broad wearing surfaces, and as well fitted as those of machinists' tools; the weight of the machine is 5,000 lbs.

The counter is furnished as follows: Shaft 2 3-16″ x 9 ft 5″, three No. 3 ball and socket hangers; T and L pulleys 12″ x 6″; pulley to drive chuck 6″ x 8″ overhung; pulley to drive spindle 30″ x 22″; pulley to drive feed 2 3-16″ or the naked shaft overhung 4″; pulley to drive front cupping spindle 20″ x 7″; speed of shaft 550 rotations per minute; speed of boring spindle 4,000; counter should be placed immediately above the main axis of the machine.

THE DANSALAN-KEITHLEY BRIDGE, DANSALAN, MORO, P. I.

This bridge spans the swiftly flowing Agus River, which has a fall of more than 2200 feet, from Lake Lanao, its source, to the coast, a distance of eighteen miles. It was constructed by the municipality of Dansalan, Moro Province, P. I., the design being drawn by the engineer of the province. The length of the bridge is 104 feet, width, 11 feet, center to center of beams, and the weight is 53½ tons.

The illustration shows the manner in which the bridge was swung across the river by Mr. S. A. Vickroy, foreman, Moro Province, Engineer's Office, the constructing work having been done on the north bank of the river, the bridge resting on rollers. When it was complete a casco was loaned by the quartermaster at Camp Keithley and was securely lashed fore and aft, to both sides of the stream. The bridge was then shoved on to the casco and slowly towed across the stream.

Mr. Vickroy was highly complimented by his superiors for his success in swinging the bridge across the river.

THE DANSALAN-KEITHLEY BRIDGE NEAR CAMP KEITHLEY, MINDANAO

NEW SPECIAL DRILLING ATTACHMENT

The Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, have recently completed an interesting special drilling attchment, applied to one of their 30" motor driven Patent Head lathes, to drill 4" holes longitudinally through the centers of steel axles 10" in diameter.

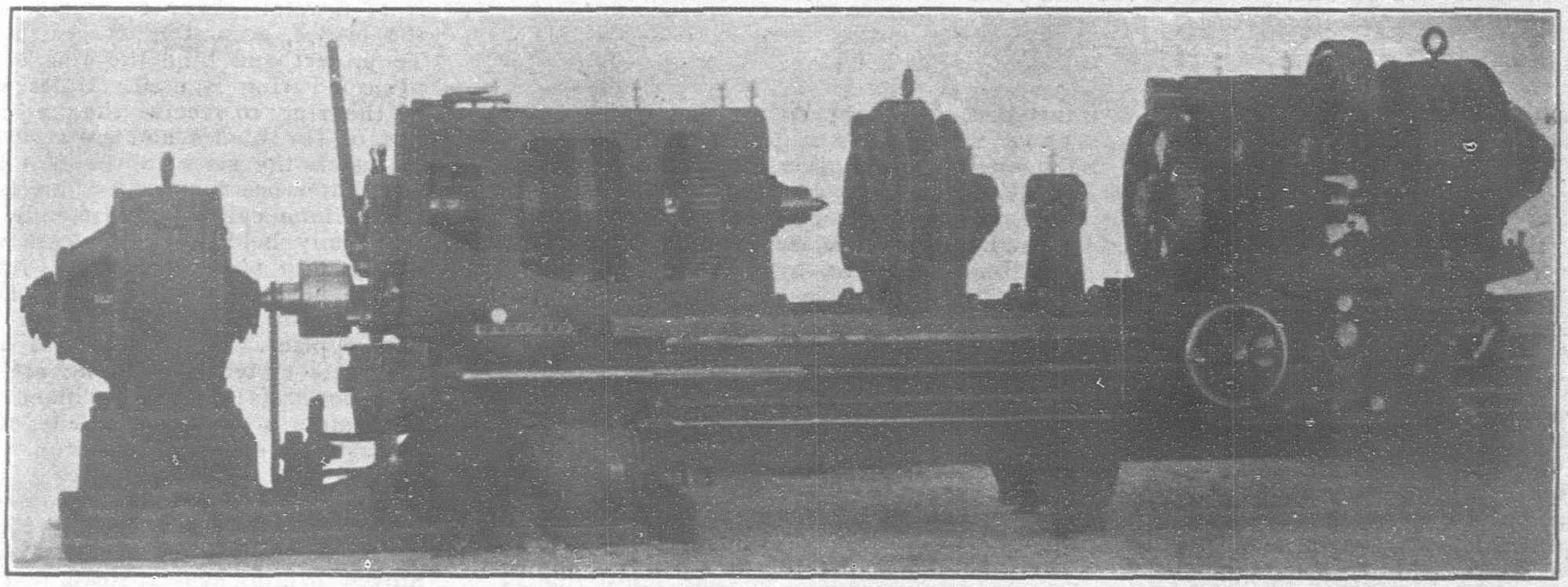


FIG. 811—FRONT VIEW OF LATHE WITH SPECIAL DRILLING ATTACHMENT ON THE CARRIAGE

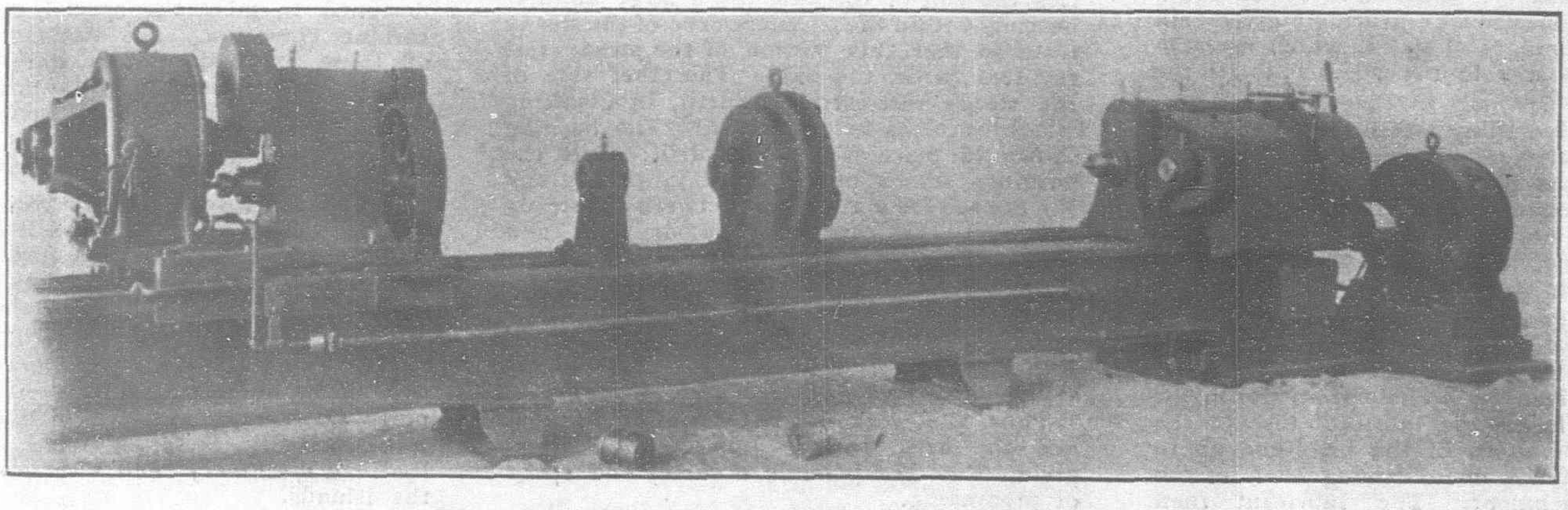


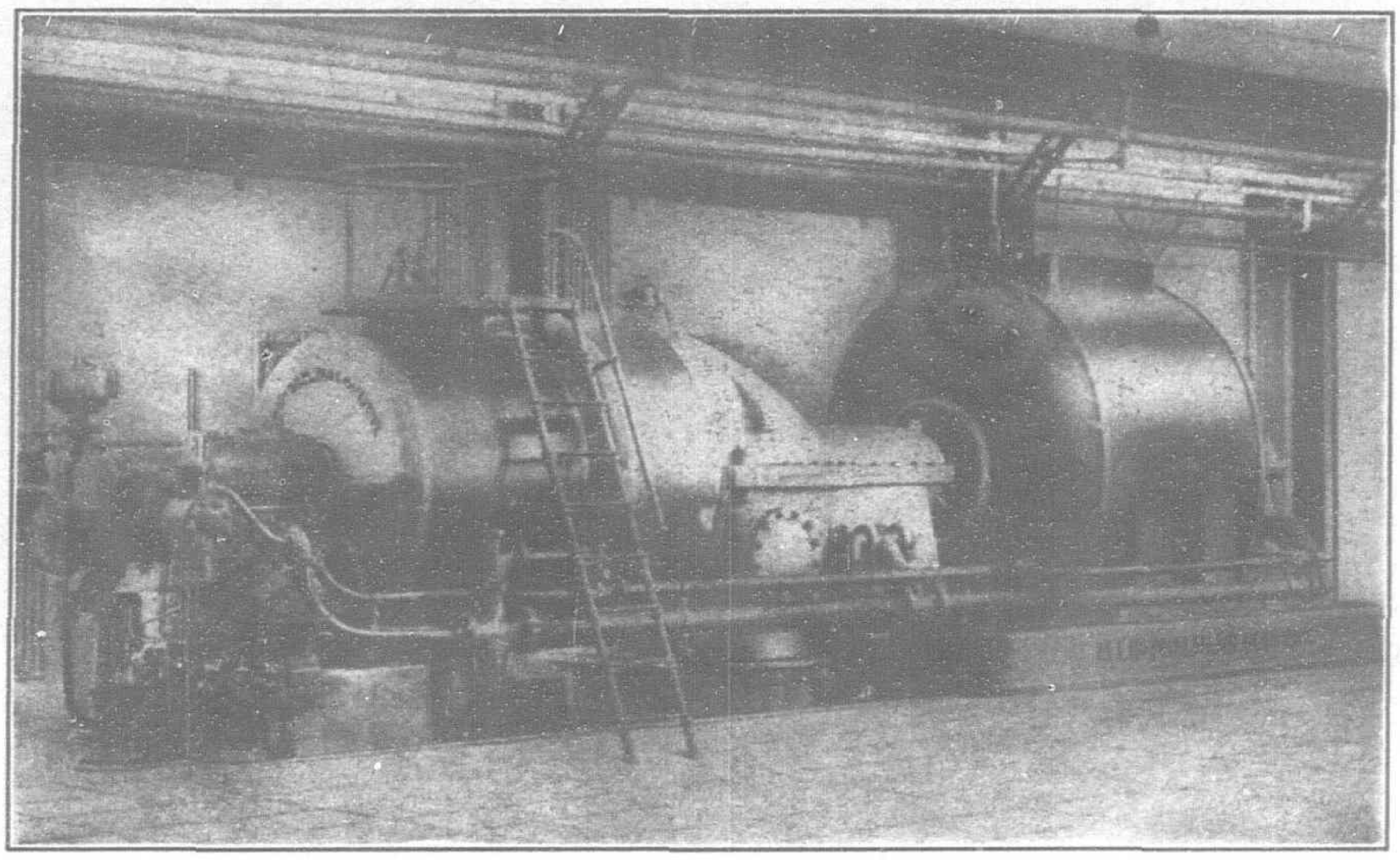
FIG. 812—BACK VIEW OF LATHE WITH GEAR COVERS IN PLACE

INSTALLATION OF ALLIS-CHALMERS STEAM TURBINE AND GENERATOR FOR THE MANILA ELECTRIC RAILROAD AND LIGHT COMPANY

The Manila Electric Railroad and Light Co. is installing a 2500 K. W. steam turbine and generator in its powerhouse in Manila thus increasing the capacity of its generating plant 50%. The new turbo-generator is being installed by Messrs. Allis-Chalmers Co. of Milwaukee, Wisconsin, under the direction of J. W. Grigg superintendent of erection and operation for the Milwaukee Company.

At present the plant comprises two-750 K. W., one 1500 K. W. and one 2,000 K. W., all Westinghouse turbo-generators, making a total of 5,000 K. W. With the Allis-Chalmers 2,500 K. W. the total will be increased to 7,500 K. W.

The 2.500 K. W. turbo-generator now being installed, is of the 60 cycle, 2 phase type 3,600 volt., 1,800 r. p. m. At full load the steam consumption guaranteed is 15.7 lb. per K. W. hour. At the usual steam pressure the current per terminal is 434 amperes normal voltage 3,600, steam pressure at throttle 175 lbs. per sq. in. by gauge; superheat of steam at turbine throttle 100° Fhr., temperature of steam 477; vacuum at turbine exhaust throttle, 28 inches of mercury referred to a 30 inch barometer; maximum above room temperature at full load 50° Cent. excitation at 120 volts, 280 amperes, at full load; the regulation is perfect. The diameter of the steam pipe at throttle valve is 7" and at exhaust outlet 36". The length overall is 29' 8", the approximate width 9' 6" and height 8' 5". The total weight is 159,000 lbs.



2500 K. W. ALLIS-CHALMERS STEAM TURBINE AND GENERATOR NOW BEING INSTALLED IN POWER HOUSE OF THE MANILA ELECTRIC RAILROAD AND LIGHT COMPANY

The present boiler capacity of the plant which comprises five batteries of Babcock & Wilcox boilers, of two boilers each, and 4.000 sq. ft. of heating surface, for each boiler is sufficient to provide all the steam necessary to supply the increased plant.

The Allis-Chalmers steam turbine is of the horizontal, multiple expansion, parallel full annular flow reaction type generally known as the Parsons' type. It embodies the designs patented by the Hon. Charles A. Parsons, C. B., together with additions made by the engineers of the Allis-Chalmers Co., as found necessary in practice. These turbines are built of three standard styles, viz, high pressure condensing, high pressure non-condensing, and low pressure condensing.

In the arrangement of the balance pistons of the Allis-Chalmers turbine a smaller piston is substituted for the largest piston upon which the steam acts in the Parsons, with the exception of those for the smaller turbines.

In the construction of the blading a foundation ring is provided that has slots cut in it of dovetail shape to receive the roots of the blades, accurately spaced, and inclined. To protect and bind the tips of the blades a shroud ring is used. Holes are punched in the ring to receive the projections on the tips of the blades and are accurately spaced to match the slots in the foundation rings. The latter are inserted in dovetail groves in the turbine cylinder and spindle where they are firmly held by key pieces which when driven into place are upset into undercut groves, locking the whole structure together and making it impossible for a blade to get out of place. The advantages of the Allis-Chalmers system of blading are summed up as follows: (1) Firm attachment of blades. (2) Ample stiffening of blades at all lengths against the effects of vibration. (3) Accurate spacing and angle of blades (4) Protection of tips so that accidental contact does not rip out blades. (5) Smaller clearances, resulting in diminished steam leakage. (6) Improved baffling against steam leakage by reason of the shape of the shroud ring. (7) Protection against a possible defective blade coming out and destroying other bales. (8) Accurate machine work as against uncertain hand work. (9) The facilities for through inspection of workmanship.

The generators used with the Allis-Chalmers turbine are of the revolving field type and are designed to meet the special conditions of turbine operation. The stationary armature of these turbo-alternators are designed to prevent undue heating of the armature core and winding. The laminated core is provided with numerous air ducts and the frame is adapted to assist in the circulation of air.

The slots formed in the core to receive the field coils are radial, and it is advanced by the manufacturers as a distinct advantage over construction with slots paralell to chords of the cross-section of the core.

The installation of the 2500 K. W. turbo-generator by the Allis-Chalmers Co. is the first made by that company in the Philippines. The representative of this prominent Milwaukee firm is Mr. Frank L. Strong, the leading machinery and electrical hause in the islands.

Photograph No. 811 is a front view of the lathe, with some of the gear covers removed to better show the gearing of the headstock and of the special drilling attachment on the carriage. In the back view of the lathe (photograph No. 812) the gear covers are shown in place; all gears are completely covered so as to fully safeguard the workman.

To take care of the unusual end thrust required to drive a 4" drill, the headstock is provided with a special tie-piece across the top, fastened to the caps of each one of the four bearings: this supports the bearings from above, as well as from below. The front and rear gear covers of the headstock are bolted to either side of this tie-piece. The headstock gearing gives six mechanical changes of speed, which are supplemented by a 2 to 1 speed variation in the motor.

The special drilling attachment is mounted upon the carriage. It consists of a heavy bracket with a train of gears driving from a direct connected variable speed motor. The main driving shaft in this bracket carries the drill, and is in exact alignment with the lathe spindle

The arrangement of pump and piping is shown in photograph No. 812. The pump is placed near the and of the headstock, and positively driven by a chain from the motor shaft. This forces the lubricant through the piping at the back of the bed, and up to the center of the main driving shaft of the drilling attachment. The lubricant then passes through the drill itself and is discharged at its tip. The pipe joint just below the carriage is fitted with a stuffing box, so that the rear section of pipe telescopes the adjoining section. This makes a good joint and insures proper lubrication of the drill, regardless of the location of the carriage. The whole machine sets in a pan (not shown in the photograph) to retain the lubricant and chips.

One end of the axle to be drilled is gripped in a chuck (not shown) on the lathe spindle, and the other end is carried in the special steady rest shown in each photograph between the headstock and the carriage. That portion of the steady rest which carries the end of the axle has a large annular bearing within the circumference of the steady rest, so that this portion of the steady rest revolves with the axle. The other side of the steady rest carries the drill, in a bushing which revolves with the drill. The bushing shown in place is for a 4" drill, while the bushings shown on the floor in photograph No. 812 are for a 2" drill. Between the steady rest and the carriage is a drill rest and guide, with a revolving bushing to support the drill at about its center. These bushings, while free to revolve, are kept from movement endwise by a set screw the tip of which enters an annular groove around the center of the bushing.

Thus, the work revolves in one direction, and the drill in the opposite direction, giving the best possible accuracy and speed of production.

THE FAR EASTERN REVIEW

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CHINA'S FOREIGN TRADE

We have to hand a copy of a review of China's foreign trade for 1910 by J. S. Chalmers, Statistical Secretary of the Imperial Customs, published in the Official Returns of Trade. Foreign imports are represented by Hk. Tls. 462,964,894 and exports by Hk. Tls. 380,833,328, making a total of direct foreign trade of 843,798,222, surpassing in value by Tls. 86,650,000 the year 1901 which is the highest recorded. According to Mr. Chalmers the increase is due largely to increased values. One item is opium where the increase represented Tls. 30,000,000 and another, cotton, Tls. 15,000,000. Increases are noted in trade through Hongkong by Tls. 33,000,000, with Japan by 27,000,000, with Germany by 12,000,000 and with Russia 6,000,000, while the only conspicuous exception is the falling off in trade with the United States by Tls. 8,000,000.

The high price of raw cotton, due to the shortage of the American supply, was responsible for the decline in importations of cotton frabrics from Europe and America. Japanese yarns and piece goods, manufactured from raw cotton imported from China and India, and sold to China showed a remarkable increase respectively, 937,908 piculs of yarn compared with 674,654 piculs in 1909 and 2,389,693 pieces of varied piece goods compared with 1,396,297 in 1909, giving some idea of the activity of the Japanese.

The increase in tea export aggregated 62,000 piculs of which Great Britain took 35,000 piculs, or 46% more black tea than in 1909, while the United States took 35,500 piculs or 42% less black tea and 27,000 piculs or 23% less green tea, making a decreased American purchase of 31%. To Russia there was an increase of 57,000 piculs or over 6%.

There was also a falling off in the export of beans to the extent of 3,500,000 piculs. The exports of raw cotton amounted to 1,247,000 piculs, about double that of the previous year. Reference is made to the development of cotton manufacture in North China which now involves 33 mills with an aggregate of 900,000 spindles and 4,000 looms the output of which represented 272,000,000 yards of sheetings and drills.

The foreign imports of Tientsin and the open port of Chingwangtao increased Tls. 10,000,000 compared with 1909. This was largely due to the increased importation of Japanese cotton, railway materials, and military equipment. The total trade of Chihli ports reached Tls. 109,587,893 and of Shangtung, Tls. 72,776,000. The Yangtsze trade reached Tls. 293,756,591 notwithstanding the poor crops and the embargo on food stuffs in the early part of the year. The striking feature of the year's trade was an increase of Tls. 11,000,000 in the value of export trade from Hankow. Shanghai's participation showed an expansion due to the advance in opium prices and the remarkable increase in the shipments of raw cotton.

The Kwangtung and Kwangsi ports yielded a total in trade of Tls. 280,660,178.

THE NATIONALIZATION OF CHINESE RAILWAYS

When the edict issued directing the early nationalization of China's trunk lines, doubt was expressed in many quarters of its feasibility, and predictions made that the scheme would meet with such serious opposition that the central government would be unable to enforce its authority. From present indications Peking continues firm in her resolve and notwithstanding the activity of provincial agitators against the measure, the preliminary work is under way and it is expected by October that effective plans for the transfer of private railway interests to the Federal government will be submitted to the conference of railway directors of the Empire to be held in Peking that month. As indicative of the prevailing foreign sentiment with respect to the nationalization we quote the following from the *Shanghai Times*.

"The decision of the Central Government to take over the control of the trunk lines of railway was not reached a day too soon. It must have been decided upon after careful enquiries had been made as to the progress of the work undertaken by the provincial companies, for since these companies have been entering their protests against the proposed action the Government has been ready with arguments to refute every statement made. It appears that the Canton provincial company succeeded in selling shares to the amount of about forty million dollars, of which about twenty million have been paid into the treasury of the company. All of this sum has been spent, and the construction of less than a hundred miles of railway is the only result. This provincial company had also a large amount of material at its disposal which was left over by the American-China Development Company. In the case of the Hunan provincial company, about five million dollars was raised, and every cent of it has been expended in the construction of thirty-five miles of railway, and the company has still several large debts outstanding. It is not known how much money was raised by the Szechuan Railway Company, but the amount is supposed to be about ten million dollars; of this large sum, three or four millions were lost in Shanghai, through the failure of Chinese banks and the speculation in rubber of the man who had the funds in charge. The situation in other Provinces has not been so bad, and it must be said to the credit of the Kiangsu Railway Company and of the Chekiang Railway Company that, as far as is known, their affairs were handled with honesty and discretion. The difficulty in the case of the three Provinces mentioned above is that there seems to be no source of financial authority to which the officers of the companies felt themselves responsible. They were only indirectly recognized by the provincial governments, and the shareholders were so widely scattered that the election of directors was little more than a farce. It was found easy for designing persons to secure election or appointment to lucrative posts, and instead of these provincial enterprises being conducted more honestly or efficiently than similar official undertakings, the contrary has been the case. Even in the most flagrant instances, officials have had their official standing to act as a check upon rapacity; but in the case of the gentry (who are only retired officials), there has been no restraint, and such peculation as has been unknown in the modern era of China has been the result. We do not believe that these serious charges against the provincial companies can be considered a reproach to the Chinese Government or the people, for, on the one hand, the Government had no control, and on the other hand, the people were not organized to exercise supervision. These provincial railway companies which we have mentioned have been conducted with gross carelessness, and it was quite time that Government stepped in to take control of them. There need be no occasion for alarm at the attitude of opposition to the Government which has been so loud-spoken in these three Provinces, for it is to be expected that the men who have been responsible for the failure of the provincial companies should fight strenuously in their own interests. The Central Government seems to have no misgivings as to the reasonableness of its position, and the only thing that remains is for proper compensation to be paid by the Government to the stockholders of the provincial companies. It cannot be expected that the Government will pay in full all the money which has been squandered. It will be sufficient if careful estimate is made of the value of the property which these companies are able to turn over to the Government and this amount should be paid in full to the shareholders. It is inevitable that there should be a serious loss to the shareholders; but for the condition which have allowed this loss they must hold themselves responsible. The Government can only purchase from the companies, at an equitable appraisement, the property of which they are in possession. This experience in railway construction is a severe blow to the growth of the influence of the people in governmental affairs, but we believe that the sturdy honesty of the people will support the Government in its determination to oust the demagogues who have been feathering their own nests at the expense of the public."

This opinion is shared more and more by progressive Chinese leaders as the result of investigations made by Peking are disclosed. The successful flotation of the Hu-Kwang loan at a premium also demonstrated that the nationalization scheme as proposed greatly strengthened China's credit abroad, and with the better understanding of Peking's purpose to protect every interest involved, the influence of the selfish agitators grows less and less.

EL BANCO ESPANOL FILIPINO

The semi-annual report submitted to the directors by President John S. Hord of the Banco Español Filipino of Manila is indicative of the continued prosperity of that institution and reflects the generally improved conditions of trade and industry throughout the Philippines. The net earnings for the term amounted to ₱212,184.89, equal to a dividend of 7% on the bank's shares issued which is ₱3,000,000. Out of this amount, however, a 5% dividend was paid, ₱35,728.29 transferred to legal reserve fund, ₱10,575 51 to voluntary reserve fund and ₱15,881.09 to the executive officers of the bank and representing 9% of the net earnings. The legal reserve is now ₱531,070.99 with circulating notes to an equal value. This represents practically double the amount of paid in capital of the bank a year ago. Deposits and other accounts have also increased materially. Commenting on the sugar situation President Hord refers to the stagnation due to the large sugar crops in Cuba and Germany but which was relieved by several sales at fair prices and better indication for July. (This has already been realized.) The bank's branch in Iloilo were enabled to see their clients through the critical period.

Of the hemp and cigar situation he says:

"The hemp situation is still most confusing, and only concerted action amongst those interested, or government intervention, or perhaps both together, will serve to avert a still more serious situation. Late advices from the United States indicate a revival in the Philippine cigar sales in that country. But the improvement will be gradual."

Mr. Hord pointed to the steady healthy growth of the exterior trade of the islands with few boom features which, he writes, "some might wish for, but which sounder judgment would condemn because of the constant danger of collapse."

Mr. Hord recommends to the wholesale merchants a credit system based on clearing house methods to overcome misrepresentation of resources and liabilities on the part of some retailers. He says:

"Some of the larger import houses have been much harassed by their inability to understand the bookkeeping of a certain influential section of the retailers, as well as by actual misrepresentation of resources and liabilities on the part of some of their customers. This has resulted in curtailment of credits by the importing houses as a measure of precaution. There is but little doubt that sooner or later a system based on the clearing house methods will be established whereby both the large importer and the small retailer doing a legitimate business will be protected against the unnecessary loss due to the present anomalous condition of affairs.

"Amendments to the law codes of the islands with respect to false representations as to resources and liabilities, and regarding attachment for debt, etc., would help to clarify the situation. Much good is expected to result from the endeavors, now taking form, of the various mercantile associations to work together to common ends in such matters where their interests are not necessarily opposed. The co-operation of the government, through necessary legislation and administrative action, with the commercial interests of the islands is assured.

"The lumber industry shows a healthy activity, the local demand being, in fact, greater than the supply."

CHINESE-AMERICAN COMPANIES

The advancement of Chinese-American trade relations has proven a popular movement among leading Chinese financiers and merchants since the memorable visit of the Pacific Coast commercial delegation in 1910. The outcome up to the present writing is one proposal to establish a Chinese-American bank with a capital of $10,000,000 with branches throughout the Empire and the United States, the capital to be furnished by Americans and Chinese in equal portions with equal representation on the board of directors. Owing to the serious financial situation in China, due to the rubber boom, the organization was deferred, but new interes is now being taken in the project and there is every prospect of its going through.

In addition to the bank the prospectus of Chinese-American Steam Navigation Company has been issued which provides for the taking over of the new 8,600 ton steamer now being built for Captain Robert Dollar and in addition the raising of $600,000 of capital. The company has been registered in the Board of Posts and the Board of Commerce at Peking as a limited company. The agencies of the Robert Dollar Steamship Co. are to be utilized by the new company.

These two companies will no doubt be the forerunner of many more as there is a growing interest among Chinese in the expansion of trade with the Pacific Coast. The proposed visit of representatives of 46 Chambers of Commerce of China to the United States in October will probably give added impetus to this intertrade movement. The Chinese Government is reported to have arranged to pay the cost of the expedition to and from San Francisco.

*PHILIPPINE OPPORTUNITIES

The Philippine Islands present to energetic, capable and enterprising people an opportunity which it would be hard to find anywhere else in the world. Here is a soil and climate capable of producing abundant harvests; here are a vast number of people under paid, underfed and never yet given an opportunity to acquire those things which are usually obtained under the American flag and unable to acquire a standard of living such as the Americans are accustomed to provide for people whom they employ. All that is necessary to greatly benefit the condition of the Filipino and at the same time reap a profit more than commensurate with the risk and effort is the application of capital and brains to the work.

Here is about ten per cent of the population of the United States in a country that can produce things which cannot be produced in the United States. People in America can afford to pay more for their luxuries than can any other people because the rate of wages is higher in the United States and many of the things deemed to be luxuries in other countries are of general consumption there because the average rate of living is high. The poorer people in the United States are accustomed to live better than are the poorer people of other countries, and as a result there is a wider market for such things as sugar, coffee, chocolate, tea and rubber.

The Philippine Islands have the advantage given by the tariff that they can admit their products to the United States free of duty whereas other countries have to pay. This gives the Philippine Islands a preference over any other country and enables us to get a better price for our products here.

With these advantages there is no reason in the world why the Philippines should not produce a very large proportion of the tropical products consumed in the United States.

The attitude of the Government is that of favoring the establishment of new enterprises; we welcome the coming of capital; we fear it not. The laws are such that undue combinations can be controlled and the Philippine Islands under their present form of government are not liable to abuses by corporate control. On the contrary, the Government is more inclined to fear the result of capital not coming to the Islands. Even with the advantages given us by the tariff, it is necessary that Philippine labor should be made effective and economical to compete with other countries. The tariff advantage will not compensate for the loss of one-half of the sugar crop by reason of faulty methods of treatment of the cane; it will not make up for the lack of irrigation, lack of ports, lack of roads, lack of machinery, lack of labor-saving devices and lack of modern methods of finance and conduct of business.

In order to avail ourselves of the lower tariff we must still adopt all those measures which modern concerns in modern countries have found necessary in order to compete in the markets of the world. We cannot afford, for instance, to let a large proportion of our tobacco crop spoil by reason of allowing the leaves to be wet by the rain while drying, we cannot afford to neglect those precautions which are necessary to keep the worms out of the leaves of our crops; we cannot afford to lose our credit by permitting adulteration of the products of the Islands, for instance, in hemp bales by placing the best quality on the outside of the bale and the poorer on the inside which has the effect of creating distrust in the minds of all purchasers of hemp and depreciates the price which producers can expect to realize.

We must take those measures which will put an end to these conditions and let people know that business in the Philippine Islands is conducted on the square; that our goods are as represented; that adulteration is not only frowned upon but not permitted, and that we make ourselves the agents of our clients and look after their interests as if they were our own.

The Government is ready to do its part in the establishment and carrying on of such a policy and the active and vigorous Merchants' Association will also do its share in bringing it about.

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*By His Excellency, Governor General W. Cameron Forbes, in the Merchants' Association Review.

The Manila Electric Railroad & Light Company and Filipino Labor

The efficiency of Filipino labor, as demonstrated under favorable conditions of employment and direction, is the subject of an interview courteously accorded the FAR EASTERN REVIEW by General Manager C. B. Graves of the Manila Electric Railroad and Light Co. in which he offers his conclusions after six years experience in charge of the operation of the extensive railway system and light and power distribution in Manila. He said:

"I would say from our experience here that the general class of Filipino operatives are satisfactory, but they require considerably more supervision than a similar force at home. This supervision must be of a high order and the Americans and Europeans employed for this purpose must be competent in their respective lines, familiar with the native dialect, and have a working knowledge of

Spanish. It is absolutely necessary to insist on painstaking instruction and correction in both Spanish and the native dialect in order that no doubt may remain that the operative understands just what is expected of him. Under no circumstance should he be allowed to begin any work without his duties being made clear. Success in the development of a substantial working force depends perhaps more on painstaking superintendence than any other feature, as an impatient overseer lapsing into English will demoralize any operative to such an extent that the latter would be unable to understand either the sense or purpose of his instructions. More depends on perfect understanding of requirements than probably any feature of training and direction. The operative generally endeavors to carry out instructions exactly as he interprets them, but it is usually found necessary to continually repeat them. For instance, with our car crews we find it necessary to maintain two weekly instruction classes for all these men and regular rules and orders are continually gone over and repeated over and over again throughout the year.

"The railway system comprises 47.5 miles of track and a maximum of 110 cars in operation. The light and power department furnishes current for approximately 85,000 lights of an average of 16 candlepower. In the work of construction, labor cost for building a mile of track on wood ties and macadam pavement runs in the vicinity of $1700 U. S. C. The monthly payroll disbursement for the entire system for labor and supervision, not including the staff, is $21,000 U. S. C.

"The total number on the payroll of the company, including the supervising foremen, averages 1097 employes which may be divided as follows:

Foreign and American foremen	33
Clerical	136
Operatives	622
Skilled Operative Mechanics	63
Laborers	218
Miscellaneous	25
Total	1,097

"The most important division, as I said before, is that of foreign and American foremen who are directly in charge of the instruction, training and supervision of the operatives and laborers in the different departments. Their work of supervision is made effective by the assistance of a large number of subforemen, checkers and supervisors, chosen from the most reliable and trained Filipinos. The successful foreman must have the virtue of patience to a remarkable degree and a knowledge of native language, characteristics and customs. Thus equipped a large measure of efficiency may be realized, as has been demonstrated by our experience in thus handling native labor. Indeed, economic and effective supervision of labor should be accorded first place in the administrative program of any company looking to successful creative enterprise in undertakings in the Philippines.

"The clerical force, which numbers 136, is under the supervision of officials of the company and their assistants, and in respect to efficiency has proven satisfactory. Under this heading are the clerks in the railway department, numbering about one quarter of the whole force, and clerks, collectors and solicitors of the light and power department. These men are carefully trained in their respective duties and a check kept on their work at all times. The result after several years of training is an almost perfect clerical organization. The clerks now on the payroll have been in continuous service and very rarely is there a vacancy.

"Under the head of operatives are included linemen, motor men, conductors, subinspectors, checkers, starters, switchboard attendants, wiremen's helpers, painters, blacksmith and shop helpers, car barn maintenance employes, freight and truck repairers, etc. These number 622 and it is their training and supervision that taxes the capacity of the foreign and American foremen. The initial training of these men cover a period of four to six weeks after which unremitting overseeing is necessary. Each man must be made to understand his duties thoroughly and trained in intelligent performance. This work may be said to be never ending for nowhere is vigilance so necessary as in the direction of Filipino labor at all times. Once trained and with the knowledge that his work is subject to the most careful scrutiny, the native operative, in any of the above capacities, gives fairly efficient service.

"The skilled operative mechanics include water tenders, machinists and blacksmiths, carpenters, winders, printers, etc., and number in all 63. They are also carefully supervised.

"The force of common laborers number 168 and include trackmen, greasers, cleaners, coal passers, ground men, power house, car barn and dock laborers.

"In connection with the success obtained in developing local labor, the remarkable change in the attitude of the native under favorable conditions and better wage, is worthy of special reference. When Messrs. J. G. White & Co. undertook the construction and installation of the present system, they found that the native laborer, familiar with the old native contract system, looked with some suspicion on the proposal made to pay him directly. It took several pay days to convince the backward that the money paid was real, but finally all the labor necessary was available although the number of names carried on the payroll sometimes doubled and trebled the actual steady working force. The laborer had no idea of thrift nor increased confort and it was usually the custom for him to lay off for a few days after pay day to put his accumulation of wealth into active circulation. Before the tracklaying was completed, however, a steady force was developed and by a careful system of encouragement and supervision most satisfactory results were obtained. Finally laborers that had formed the habit of taking a few days lay-off after pay day upon reporting for duty found their places filled and by Filipinos inclined to report every day and a place on the working force rose to a premium. The opportunity that better wages afforded to buy comforts for his family soon appealed to the average Filipino and he became a steady, reliable employe. Indeed, among the 1097 now on the company's pay roll, and well towards the top, are many of those early construction laborers who helped J. G. White & Co. install the system.

"In organizing the system of operation higher rates of pay were inaugurated than prevailed in Manila and the Company was subjected to considerable adverse criticism on that score, but the wisdom of this policy has been demonstrated in the better class of men attracted and in better service to the public. The application-for-employment list is always overflowing and during a strike in 1909, which involved 400 employes, the most difficult problem confronting the Company was the selection of the best material from the deluge of applicants. Indeed, there were scores of men then appointed who walked or ran all the way from provincial towns to take advantage of the opportunity to work for the company.

"The men are constant in their employment although among conductors there are many more changes than are usual a thome and also more than in any other department of the company here. One most desirable virtue of the Filipino employes that will be appreciated is their abstinence. There is almost an entire absence of intoxication among them.

"In general, from the adaptability standpoint, the Filipino, in our opinion, makes a satisfactory operator when properly trained and supervised. With increasing investment and a greater supply of low class labor he will find associated employment in varied creative investments now being inaugurated.

"The men are naturally of a happy disposition and generally uninclined to thrift. Most of them spend as they go, but I recognize a growing tendency among the older employes to save a little, and as conditions have been created here making it possible for anyone to secure an education and acquire property, I believe that there will be continued improvement in the status of the individual Filipino operator and laborer.

"Political questions create no interest among the employes of the company and those who own a little property are not looking with delight at the prospective withdrawal of the present American association in the government, nor of the elimination of the liberal American consumer and rent payer."

The above interview should be read with great interest by prospective investors in creative enterprises in the Philippines. It demonstrates that the Philippines have their share of labor and its successful development for any special line of endeavor rests entirely with the employer. Every success of pioneer enterprises such as that of the Manila Electric makes for the general improvement of labor condition throughout the islands.

The company has given especial attention to the welfare of its employes. Medical and hospital service is provided free of charge and the men are encouraged to thrift. Care is taken to recognize efficiency by prompt advancement. Every facility to encourage the employe to equip himself with a thorough knowledge of all the phases of railroad and light and power work is provided. A school course is within the reach of every native on the pay roll. Here they are given practical instruction in rules and the details of the many features of railroading with which they come in contact every day. The instructors are familiar with the language and local conditions and their work dovetails into every day performance.

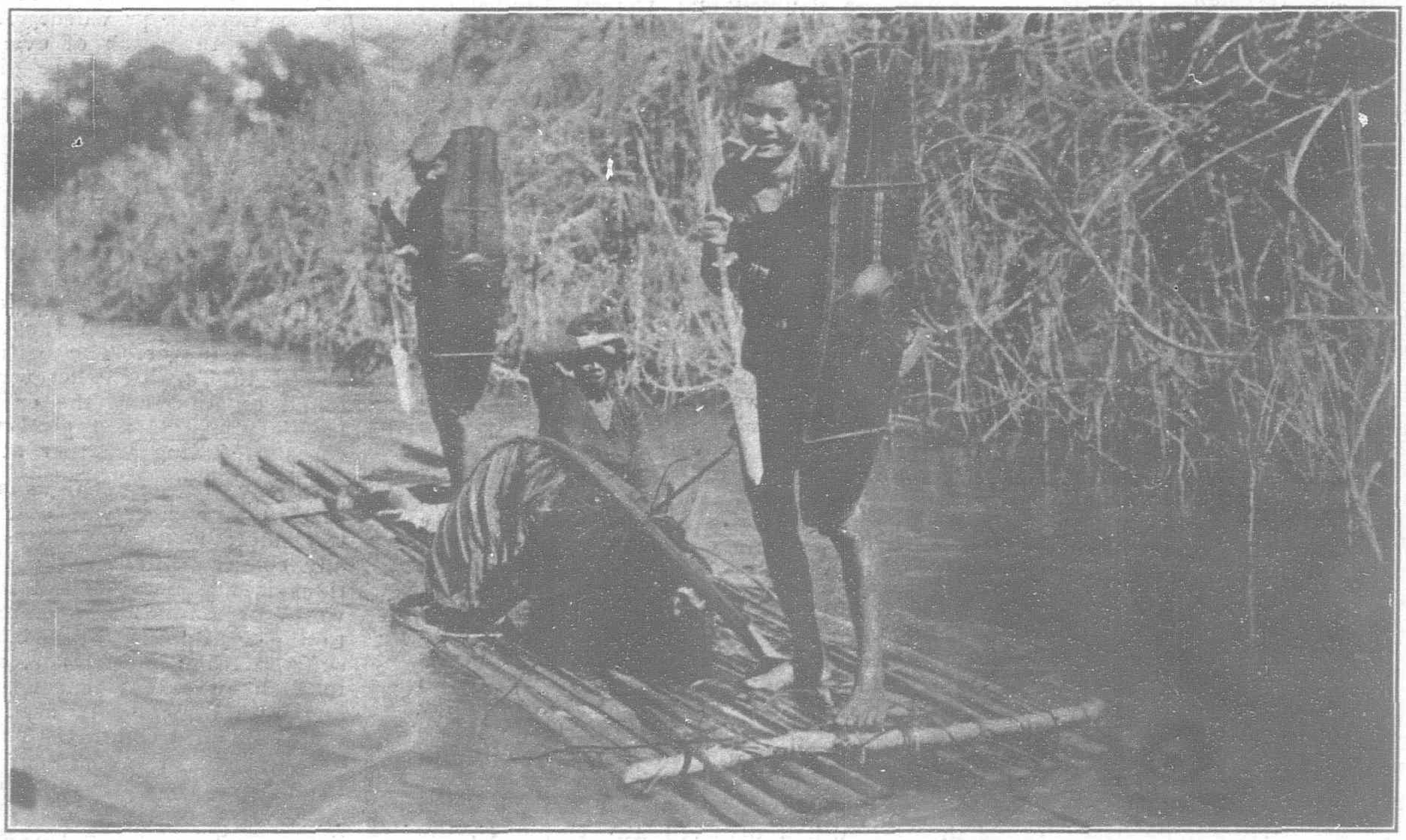
Healthy outdoor amusements are encouraged. The M. E. R. R. & L. Co. baseball team is the pride of every employe and official of the company from the trackman to the general manager. The batting average is discussed in Tagalog wherever two or three are found together and the enthusiasm over the team's prospects is typical of the esprit de corps prevailing whether at work or at play.

It may be accepted as a definite axiom that in any successful enterprise involving the employment of a large force of labor in any country, intelligent study of local conditions is necessary, and of no section of the world does this apply more strikingly than to the Philippines where labor until recently suffered from indifference, neglect and abuse to such an extent that its spirit was broken and with difficulty induced to respond to more liberal treatment. The pioneers in the development of the present efficient Filipino labor from its status under centuries of peonage deserve great credit for patience and perseverance and the successful outcome of their intelligent efforts, as in the experience of the Manila Electric Railroad & Light Company, removes effectually the reflections cast upon the Filipino as a laborer. And it also demonstrates that the basis of reports of alleged inefficiency of Flipino labor may be found largely in the incapacity of employers in failing to provide the necessary measure of intelligent training, supervision, and control of the material to their hand

THE DEVELOPMENT OF THE HILL PEOPLE OF THE PHILIPPINES

In the government of the Philippines, the administration provided for special supervision of what are termed the non-christian tribes, as separate and apart from that of the Christian or civilized Filipinos. The control of these hill people takes a more paternal form, designed to reclaim them from savagery and encourage them in arts of peace.

SECRETARY WORCESTER MAKING FRIENDS WITH THE MANDAYAS BY DISTRIBUTING BEADS



GOOD-NATURED MANDAYAN SAVAGES ON THE UPPER AGUSAN RIVER IN MINDANAO

They are ready for peace or war. The people of this tribe have not yet been brought under effective Government control.

The non-christian population comprise about one-eighth of the population of the Philippine archipelago and inhabit the more or less inaccessible mountain regions of the different islands. The different communities, in the state in which they were found, were continually at war with each other. Indeed in whatever section of the islands found, the total male population were always in arms either for defensive or offensive operations while the women and children were the only producers. The taking of heads for trophies was the popular pastime. These conditions applied generally to all these scattered tribes when the islands became American territory, and presented a serious problem to the administration. Very fortunately, among the members of the Philippine Commission was Mr. Dean C. Worcester, who previous to American domination had travelled extensively throughout the islands and was more or less familiar with the characteristics of these wild, yet simple people. When he accepted the portfolio of Secretary of the Interior the non-christian tribes were placed under his supervision. He at once inaugurated a program designed to eliminate the continual internecine warfare, encourage intercourse between neighboring tribes, and interest them in agriculture and other peaceful pursuits. This was no easy task, for the hill native had reason to be suspicious of the people of the flat country, but Secretary Worcester by his personal courage invaded their inaccessible territory, won their confidence, and by fair dealing has managed to popularise the baseball bat and the plowshare where the headaxe was once the only implement emblematic of prowess. He has demonstrated that the savage of the Philippine is amenable to fair treatment and kindness and that his word is as good as his bond. Some idea of the progress of this magnificent work may be gathered from excerpts from Secretary Worcester's report for 1910. For instance in the Mountain Province he says:

A MANDAYA HOUSE

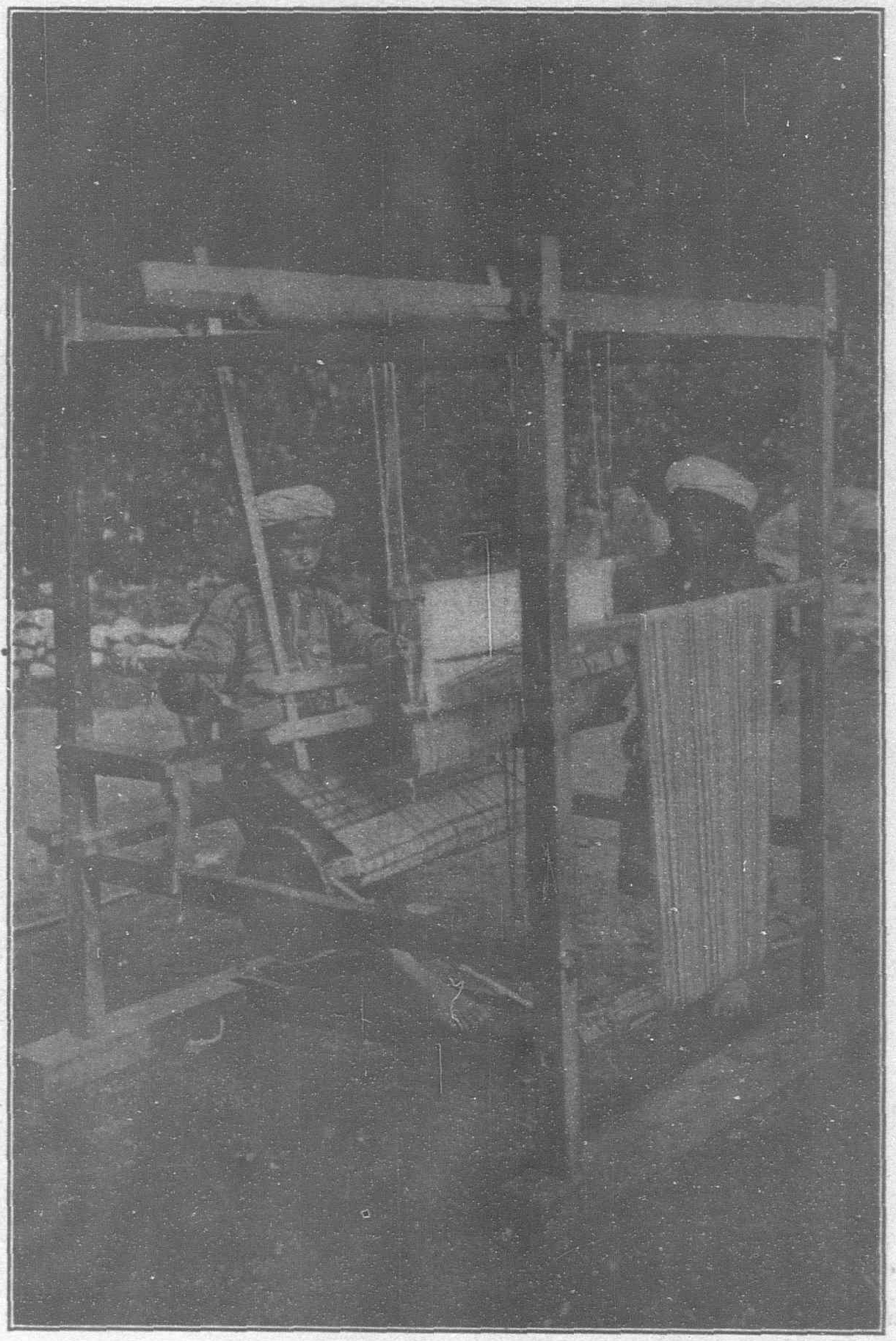
"No heads have been taken during the year among the 117,000 Ifugaos, and very few among the Igorots or the Kalingas. Governmental control has been rapidly extended over the Kalinga settlements, although Lieutenant-Governor Hale has been repeatedly warned that if he attempted to go to certain settlements his head would be taken. In such cases he has visited the obstreperous settlements at the earliest possible opportunity, often taking no other escort than a few of his own Kalinga policemen. In several instances spears have actually been thrown at him, but he has displayed admirable courage in dealing with the troublesome situations thus created and has succeeded in establishing friendly relations with such settlements and in gaining a reasonable degree of control over their inhabitants."

An evidence of the success of Secretary Worcester's pacific policy in dealing with his wards under trying conditions, in fifteen years of experience with the wild tribes he has never fired a shot, nor had any member of one of his parties, or its escort, done so, until last year when a treacherous Moro leader and murderer of Palawan attempted to ambush him and his companions at Culasian Bay where four of the dato's followers were killed as they attacked the guard. No one regretted the incident more than Mr. Worcester, but it was unavoidable. In all sections of the islands where his duties call him in connection with these people, he usually goes unattended and unarmed.

In the two sub-provinces of Butuan and Bukidnon of Agusan, Mindanao, great progress has been made in stimulating commercial development through government exchanges. As the secretary puts it in referring to Butuan, the effect on public order has been most fortunate. "People who are busy growing and stripping hemp have little time for murder and head taking".

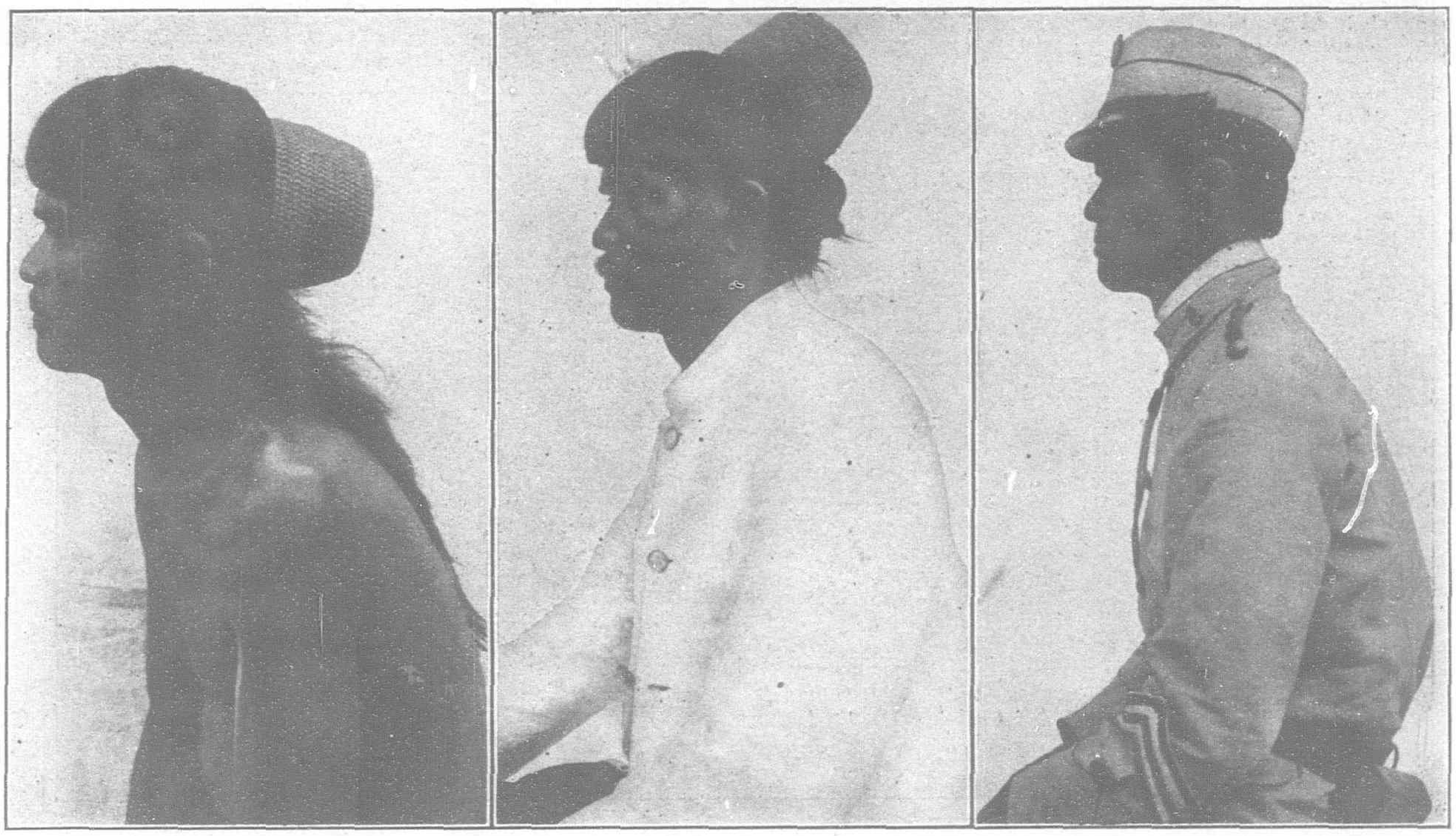
Bukidnon comprises almost level table lands sloping gradually from 900 to 3,000 feet above sea level with streams so boisterous as to be unnavigable. The progress made among them has been more rapid than among any other non-Christians under American rule. The settlements are models of cleanliness and the state of public order most satisfactory. The only influence tending to interfere with the steady progress of development has been traced to the Christian population of Misamis province who resented the interest taken by the Insular authorities in encouraging and protecting these people. This is better explained by Mr. Worcester in an excerpt from his report in which he says:

"It is probably true that in no part of the Philippine Islands were members of the non-Christian tribes so robbed and oppressed as were the Bukidnon people prior to the establishment of a special government for their protection. They are comparatively industrious, and bring down to the coast hemp,



BENGUET IGOROT GIRLS WEAVING

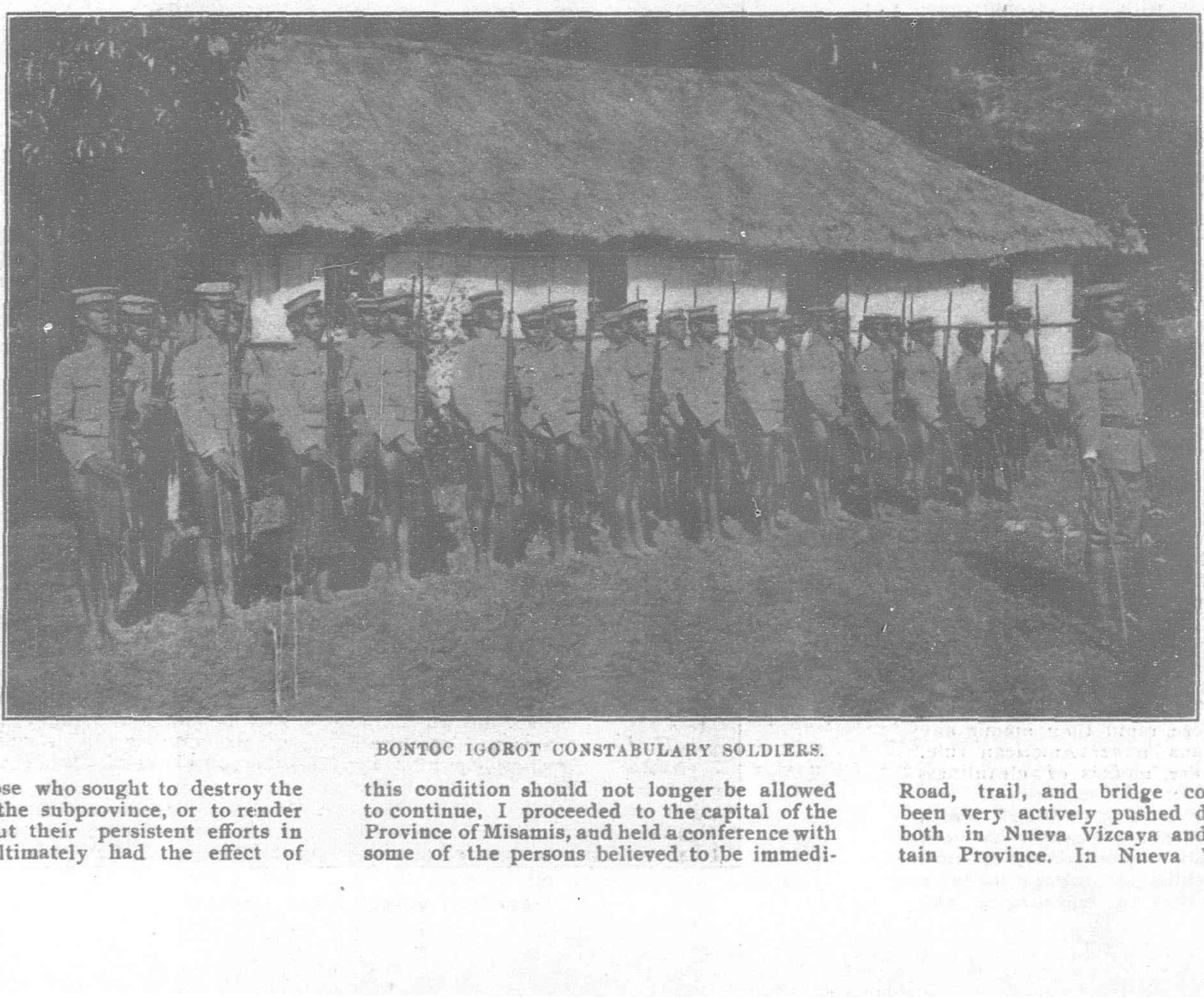
cacao, and coffee in considerable quantities. Formerly they also brought out a good deal of gutta-percha. These products they were compelled to sell to the Christian Filipinos at prices fixed by the latter, to whom this arrangement was most advantageous. It was to be anticipated that measures which resulted in freeing the people whom they had so long oppressed would meet with their most bitter and determined opposition. This expectation has been fully realized. During a period of more than two years I dealt very gently with those who sought to destroy the government of the subprovince, or to render it ineffective, but their persistent efforts in this direction ultimately had the effect of bringing Lieutenant-Governor Frederick Lewis, who was the special object of their malevolence, to the verge of breakdown, and in several instances caused the sudden and otherwise unexplainable migration to the neighboring mountains of hitherto quiet and peaceful residents of settlements. Although these people were ultimately practically all persuaded to return to their homes, their extraordinary action in temporarily leaving them caused uneasiness and even excitement among those who remained behind. Believing that this condition should not longer be allowed to continue, I proceeded to the capital of the Province of Misamis, and held a conference with some of the persons believed to be immediately responsible for it and with officials whose duty it was to end it. In the course of this conference I frankly informed those present that if there were not a prompt cessation of hostilities I should personally interest myself in active measures looking to the arrest and trial of those who were continuing seditious secret agitation. The result has been a falling off in efforts to destroy the usefulness of this sub-provincial government."



1901 1902 1903

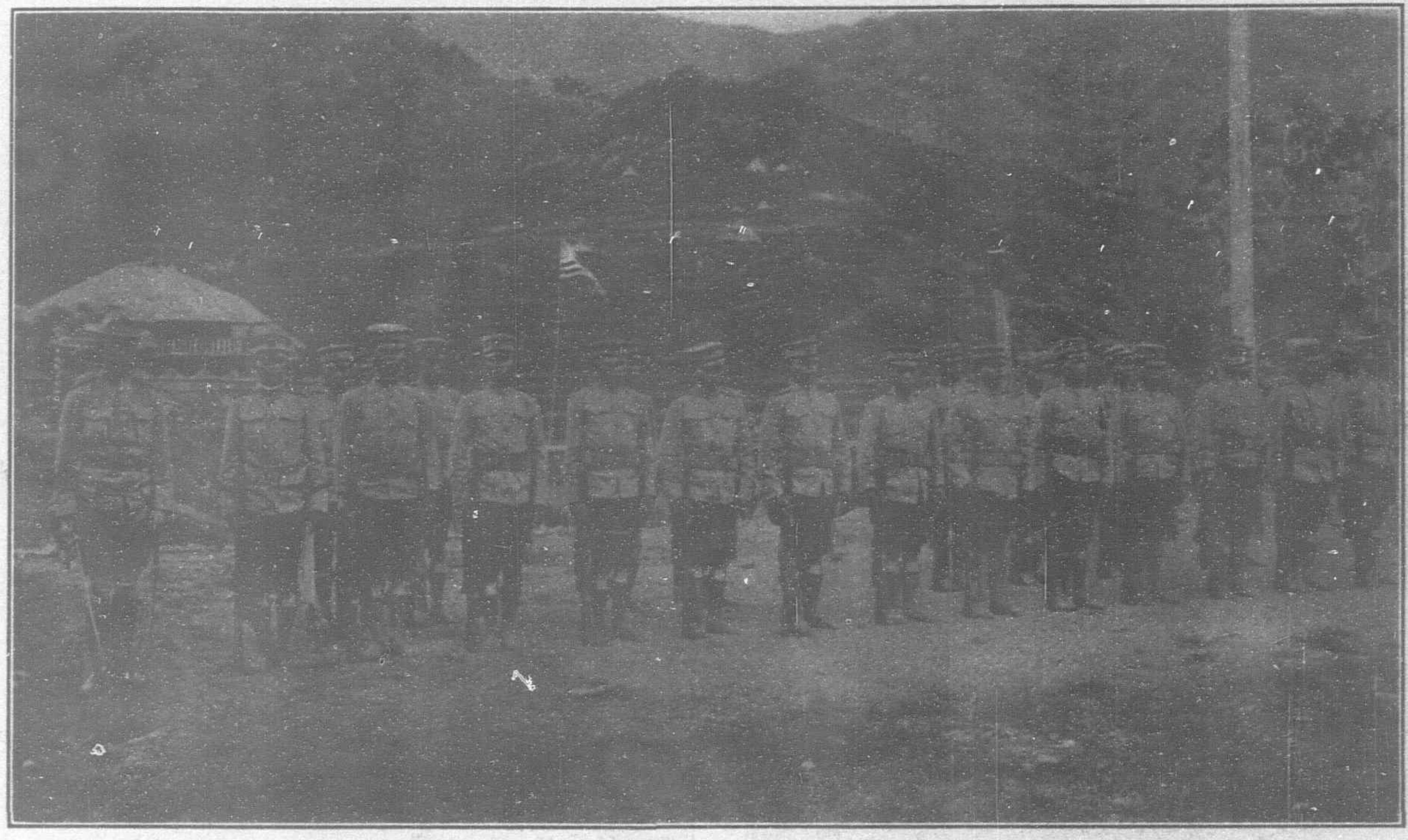
THE EVOLUTION OF A BONTOC IGOROT CONSTABULARY SOLDIER.

Showing a Bontoc Igorot in 1901, when he was a head-hunting savage; in 1902 after he had been for a year in contact with Americans, and in 1903 when he was a well-disciplined and competent sergeant of a company of Philippines Constabulary made up of his fellow-tribesmen.

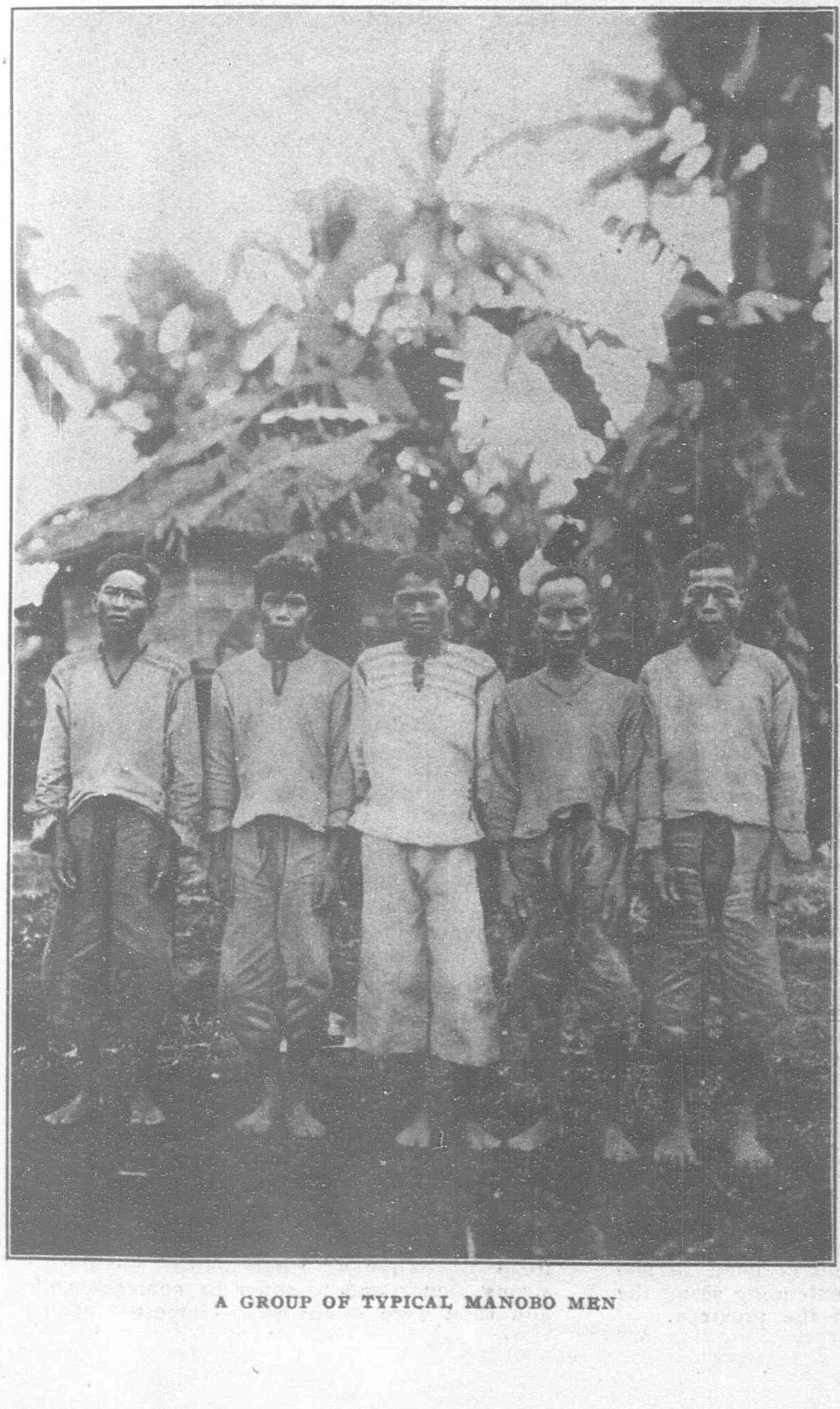


BONTOC IGOROT CONSTABULARY SOLDIERS.

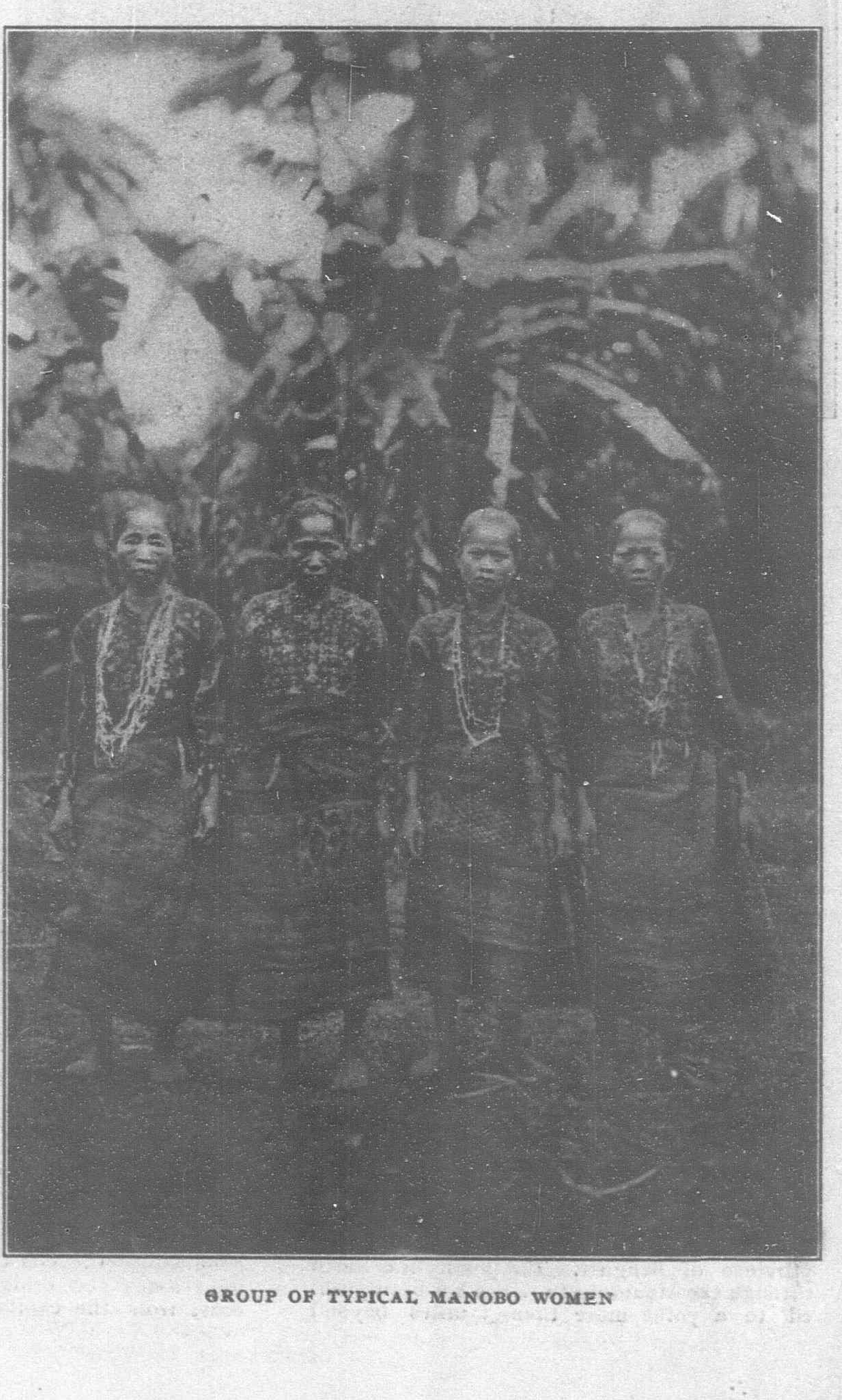
"*Development of means of communication.*—Road, trail, and bridge construction have been very actively pushed during the year, both in Nueva Vizcaya and in the Mountain Province. In Nueva Vizcaya a good



IFUGAO CONSTABULARY SOLDIERS IN COMMAND OF LIEUTENANT DOSSER



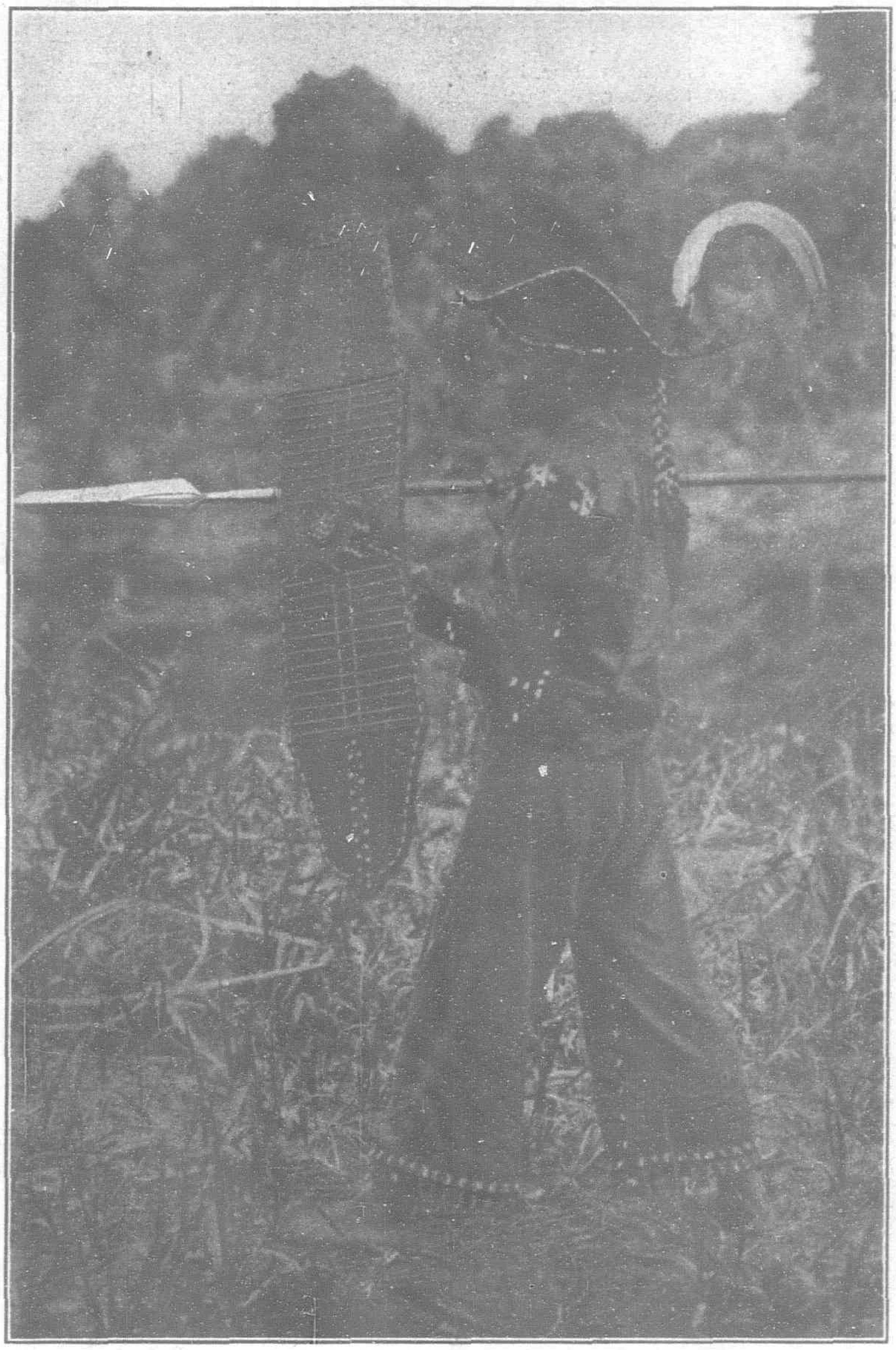
A GROUP OF TYPICAL MANOBO MEN



GROUP OF TYPICAL MANOBO WOMEN

DATA BADAO AND HIS WIFE

This woman has, in the past, practically held power of life and death over Manobos in the upper Agusan Valley, as her orders relative to killings were implicitly obeyed. Badao and his wife are now living quietly at Waloe, where there is a Constabulary garrison.



MANDAYA WARRIOR

start has been made toward opening up the Ilongot country, into the heart of which trails will be pushed as actively as possible. In the Mountain Province there now exist some 730 miles of excellent low grade horse trail. Narrow-tread carts are being run from Tagudin, on the coast, to Cervantes, the capital of the subprovince of Lepanto, and in a short time will be running into Bontoc, the capital of the Mountain Province. A new low-grade trail from Cervantes to Bontoc has been completed with the exception of two bridges. A line has been staked and cleared for a similar trail from Bontoc to connect with the Ifugao trail on the top of the Mount Polis Range, and a considerable amount of construction work has already been done.

"In the subprovince of Ifugao there were 20,000 road laborers available for ten days' work each during the year. Old trails have been widened and improved, and there has been a large amount of new construction, including the opening up of a trail into the heart of the hitherto almost inaccessible Silipan district, and the completion of half of the work on a new trail through the equally inaccessible Asin region to Bugias in the subprovince of Benguet. The main line north through the Mountain Province has been pushed to a point more than 3 miles beyond Tabuc, into the subprovince of Kalinga, and during the present year should be extended well into the subprovince of Apayao. It is within the range of possibility that two years more may see a through route for horseback travel completed from Twin Peaks, in southern Benguet, to Claveria, at the extreme northern end of Luzon. Very great damage was done to trails throughout the Mountain Province by the destructive typhoon of October, 1909, and as repair of existing trails necessarily takes precedence over construction work, it was not possible to build as much new trail as had been planned. It is hoped, however, that some 300 miles can be completed in the Mountain Province during the fiscal year 1911.

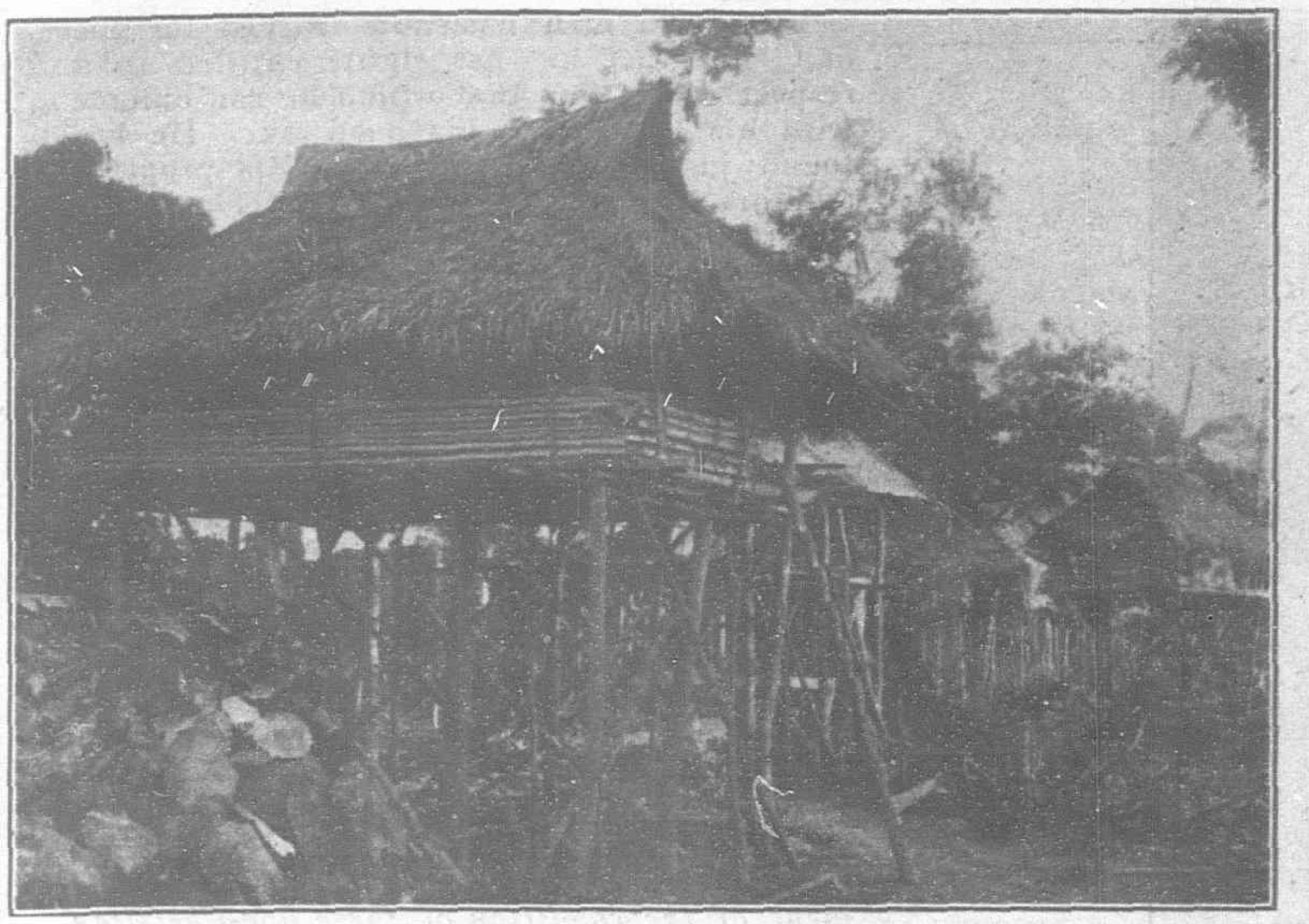
"Nothing has as yet been done in the way of trail construction in Apayao, and soon practicable efforts must be centered upon the opening up of a line of travel through this subprovince. Until this has been accomplished, very rapid progress in civilizing its unruly inhabitants can hardly be expected.

"In Mindoro road work has been pushed as rapidly as the very limited funds of the province would permit. No trail work has as yet been undertaken and efforts have been confined to the constrution of good permanent roads and bridges extending along the coast from the capital of the province.

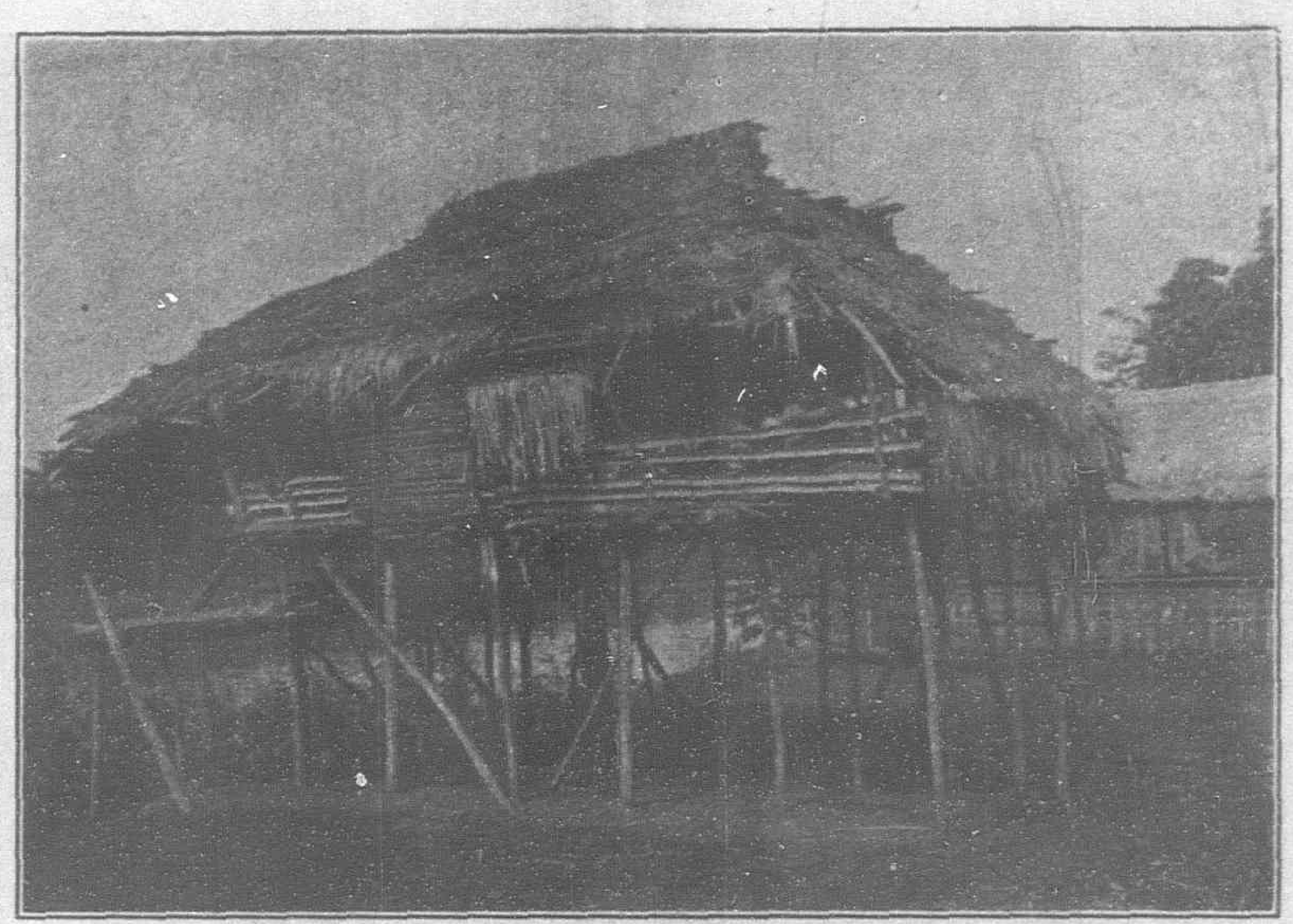
"In the subprovince of Bukidnon the people have cooperated actively with the lieutenant-governor in his efforts to improve their means of communication, with the result that a very large amount of road, trail, and bridge work has been done at extraordinarily low cost. In the subprovince of Agusan work on the Cabadbaran-Butuan Road, which is opening up a very rich agricultural region, has progressed slowly, and a new trail has been constructed from La Paz to Segunto and thence to Waloe, the first two settlements named being on the Adgauan River, and the last on the Umayan River. The effectiveness of the Constabulary garrison at Waloe has been thus greatly increased.

"In my opinion the next important step which we should take in stimulating the development of the hill tribes of northern Luzon is to develop trade among them as actively as possible.

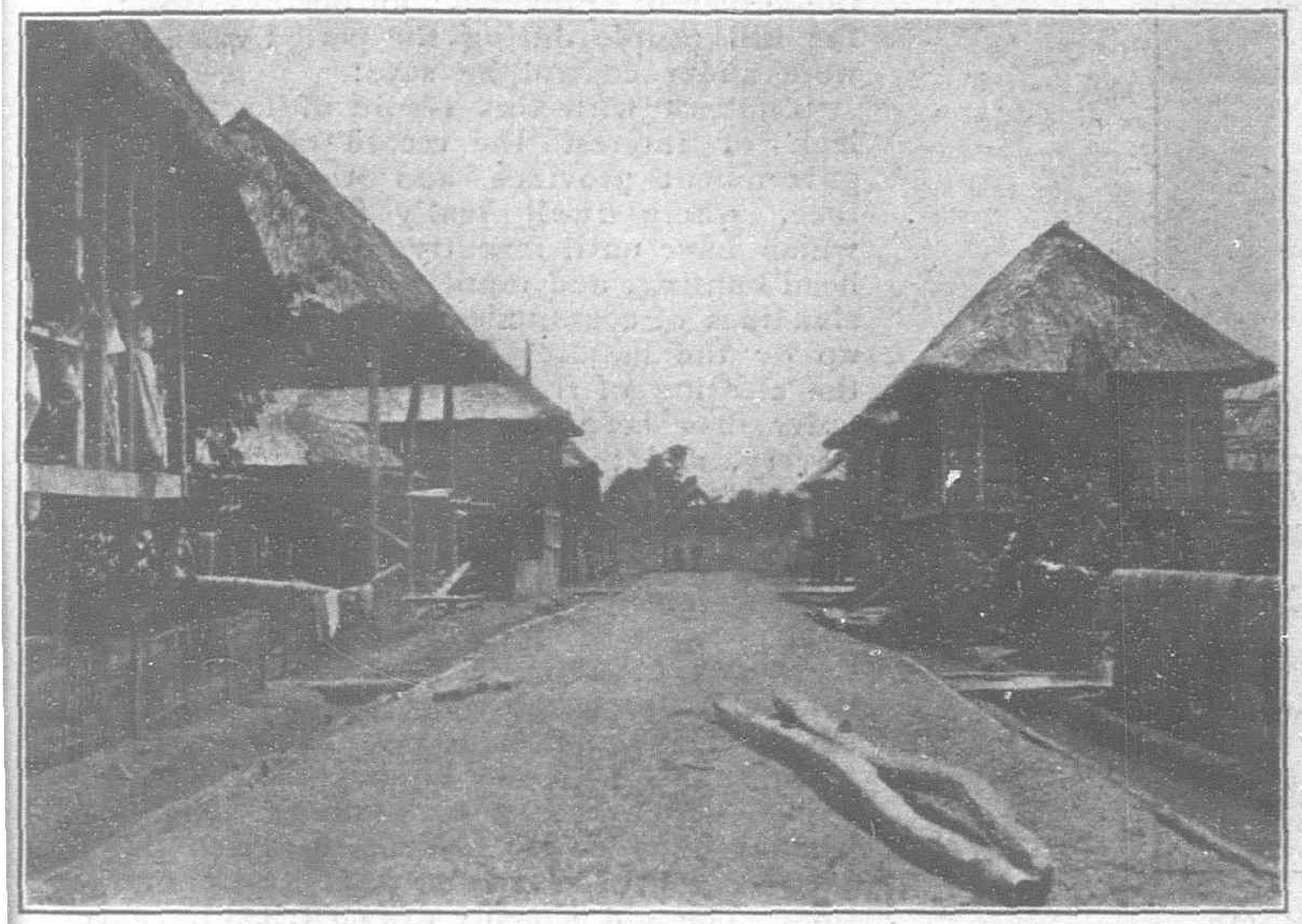
"In the past it has been necessary for the wild men to make long and tedious journeys to the coast towns in order to purchase the salt, cloth, steel, and other necessary articles which they themselves did not produce. The sudden change in climate involved in a rapid descent to the lowlands often made them ill. They were apt to drink too much strong liquor and to suffer in consequence, and they were often badly imposed upon



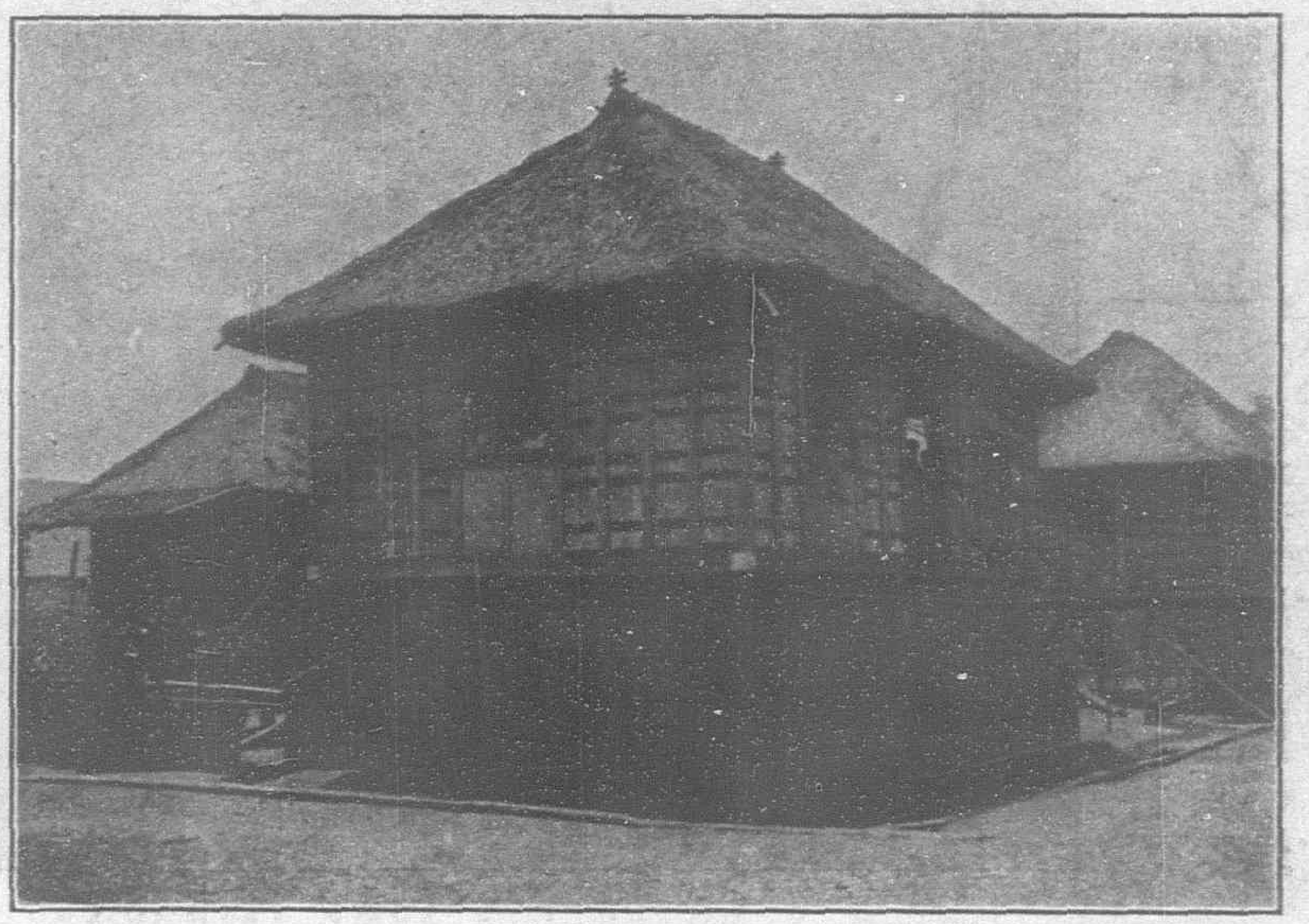
"STREET" IN AN OLD-STYLE MANOBO TOWN



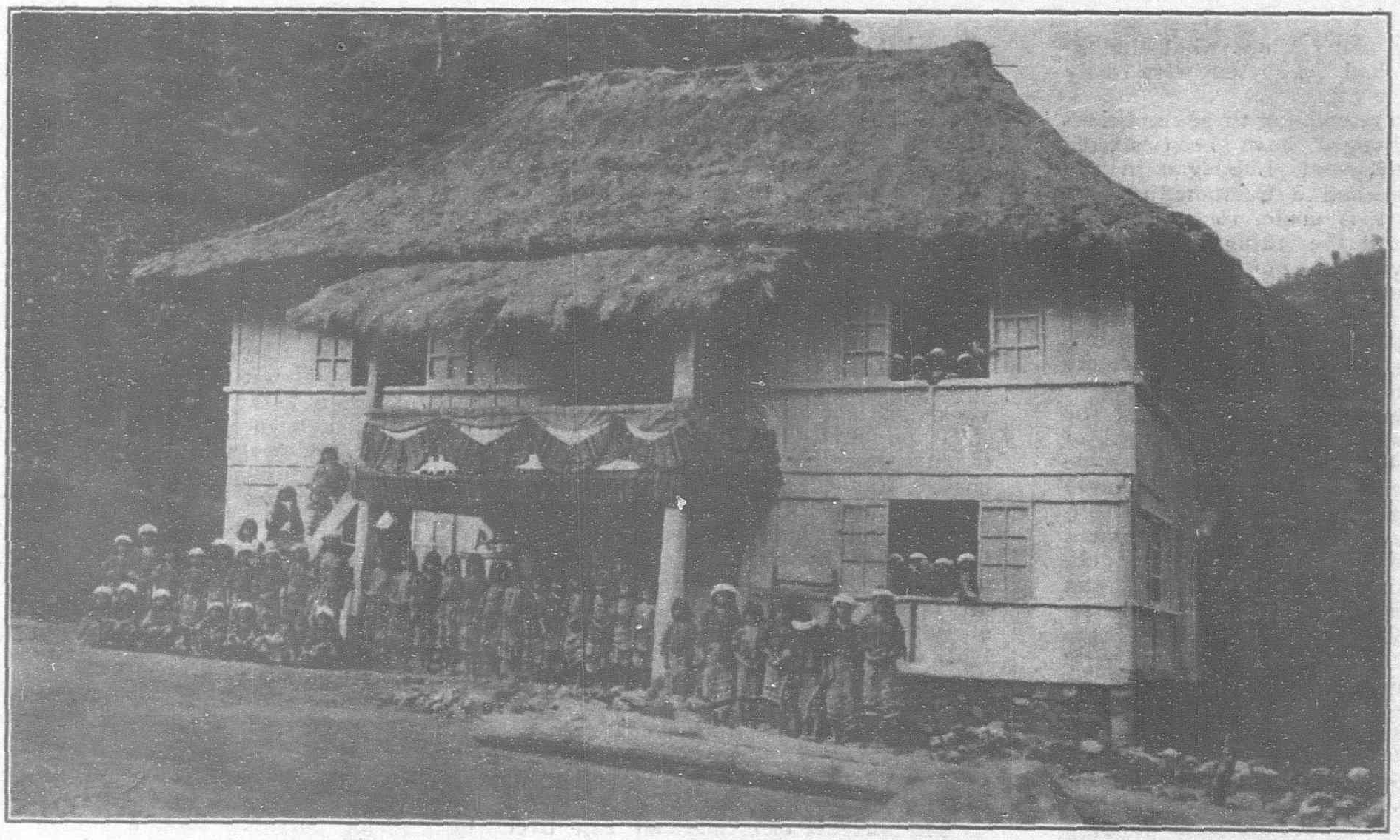
MANOBO HOUSE, OLD STYLE



STREET IN ONE OF THE NEW MANOBO TOWNS WHICH HAS BEEN DRAINED SO AS TO ELIMINATE MOSQUITOES



MANOBO HOUSE, NEW STYLE



SCHOOLHOUSE BUILT BY BENGUET IGOROTS AT KABAYAN
The girls shown in this photograph are being taught to weave cloth.

LIEUT. E. Y MILLER, U. S. ARMY, LATE GOVERNOR OF PALAWAN, AND SON OF DATO BATA-RASA

GOVERNOR MILLER WAS ONE OF SECRETARY WORCESTER'S MOST ABLE ASSISTANTS

and made to pay many times what the articles which they had purchased were really worth.

"With a view to remedying these conditions Government 'exchanges' have been started at Bontoc, Banaue, and Lubuagan in the Mountain Province, and a Campote in Nueva Vizcaya. An effort is made to keep these stores supplied with the things which the people in their vicinity most need. Sales are made at Manila prices plus 20 per cent and the cost of transportation. The 20 per cent is intended to cover dead stock and loss or injury to goods on the trail and slowly to increase the capital of the exchanges."

An insistent demand on the part of the Christian Filipinos to secure the control of the Hill Peoples has been in vogue for some time to which Secretary Worcester is strongly opposed on the ground that Christian Filipinos who now enjoy local self-government have not demonstrated adaptability or inclination to "dominate, justly control, and wisely guide along the pathway of civilization alien peoples, some of whom are warlike." And further Mr. Worcester says:

"In asking that this territory and its people should be turned over to him by the Americans, he is presumably actuated by high motives and a desire to promote the social development and the material prosperity of the people concerned; but in making this claim, and at the same time denying the right of the Americans to control him and his territory with a view to promoting the same desirable ends, he places himself in a somewhat anomalous logical position." Proceeding to the obstacles in the way of carrying out the serious policy of the government under Filipino direction the Secretary says:

"The average hill man hates the Filipinos on account of the abuses which his people have suffered at their hands and despises them because of their inferior physical development and their comparatively peaceful disposition, while the average Filipino who has ever come in close contact with wild men despises them on account of their low social development, and in the case of the more warlike tribes, fears them because of their past record for taking sudden and bloody vengeance for real or fancied wrongs.

"It is impossible to avoid plain speaking if this question is to be intelligently discussed, and the hard fact is that wherever the Filipinos have come in close contact with the non-Christian inhabitants, the latter have almost invariably suffered at their hands grave wrongs which the more warlike tribes, at least, have been quick to avenge. Thus a wall of prejudice and hatred has been built up between the Filipinos and the non-Christian tribes. It is a noteworthy fact that hostile feeling toward the Filipinos is strong even among people like the Tingians, who, barring their religious beliefs, are in many ways as highly civilized as are their Ilocano neighbors.

"The success of American rule over the non-Christian tribes of the Philippines is chiefly due to the friendly feeling which has been brought about.

"The wild man has now learned for the first time that he has rights entitled to a respect other than that which he can enforce with his lance and his head ax. He has found justice in the courts. His property and his life have been made safe, and the American governor who punishes him sternly when he kills is his friend and protector so long as he behaves himself. He learns to like that American. Because of his manliness and courage when his friendship is once won, the American learns to like him, and finds compensation for the loneliness, the hardships, and the dangers of his isolated life, in the friendliness and appreciation shown by those for whose advancement he is striving."

The Filipinos at the outset exercised the same control over the hill tribes as their own people and had an opportunity to demonstrate their interest in the hill people under their charge the result of which as Mr. Worcester puts it:

"*To the best of my knowledge and belief, not one single measure looking to the betterment of the condition of these non-Christian inhabitants was ever inaugurated by a Filipino during this period.*"

After reviewing the undesirable attitude of the different provincial authorities towards the hill people during the period when they were under control, he says:

"Contrast with this record of inaction and lack of interest the record of the special government province and the Moro Province, where dwell really formidable tribes which have until recently engaged in piracy, head-hunting, and murder. Here very extensive lines of communication have been opened up by the building of roads and trails and the clearing of rivers. A good state of public order has been established. Head-hunting, slavery, and piracy are now very rare. The liquor traffic has been almost completely suppressed. Life and property have been rendered comparatively safe, and in much of the territory entirely so. In many instances the wild men are being successfully used to police their own country. Agriculture is being developed. Unspeakably filthy towns have been made clean and sanitary. The people are learning to abandon human sacrifices and animal sacrifices and to come to the doctor when injured or ill. Numerous schools have been established and are in successful operation. The old sharply drawn tribal lines are disappearing. Bontoc Igorots, Ifugaos, and Kalingas now visit each other's territory. At the same time that all of this has been accomplished, the good will of the people themselves has been secured. They are outspoken in their appreciation of what has been done for them, and in their expression of the wish that American rule should continue. They would be horrorstricken at the thought of being turned over to Filipino control."

And further: "I say it in all kindness, but with deep conviction, that there is no reason for believing that Filipino control of the more pacific non-christian would not promptly result in the re-establishment of the old system of oppression which Americans have found it necessary to combat from the day when military rule was first established in these islands until now. I speak whereof I know when I say that the people of these tribes have been warned, over and over again, by those interested in the re-establishment of the old regime, that American control in the Philippines will be only temporary, and when the government is turned over to the Filipinos the tribesmen will be punished for their present "insubordination," and failure tamely to submit to injustice and oppression as many of them formerly did." In conclusion Secretary Worcester writes:

"In view of the facts stated, I am of the opinion that to turn the control of the non-Christian tribes over to the Filipinos would speedily result in disaster. As the Filipinos have no just claim to the territory which the non-Christians occupy, I see no reason for pursuing such a course.

"It has been my highest ambition as Secretary of the Interior for the Philippine Islands to bring the work for the non-

CONTRACTING NEWS

BIDS OPENED AND CONTRACTS AWARDED

U. S. Chief Q. M., Manila.—Conduct and electrical fittings, including 32,485 lbs. iron bushings, outlet boxes, locknuts, covers and 27,000 feet of conduct.—Contract awarded Frank L. Strong, price $3,116.75. The other bidder was Messrs. Germann & Co., price $3,197.90.

U. S. Navy, Manila.—50 h p., D. C. 650 r. p. m. Motor.—Contract awarded Castle Bros.,-Wolf & Sons (Fairbanks, Morse & Co.'s motor), price ₱1,380. The other tenders were: F.H. Thompson, ₱1,593 (Westinghouse Manufacturing Co.); Messrs. E. C. McCullough & Co. ₱1,600 (unknown); Germann & Co., ₱1,750 (Siemens & Schukert); Frank L. Strong ₱1580 (Central Electric); the Electrical Supply Co., ₱1,200.

U. S. Q. M. D., Manila.—10-ton locomotive crane.—Contract awarded Frank L. Strong, $6,275 (Brown's Hoisting Machinery Co.). The other tender was that of Messrs. Castle Bros.,-Wolf & Sons, $9,700.

U. S. Q. M. D. Water Transportation.—Air Compressor, etc.—Contract awarded F. L. Strong $350 for 4½x 4½ (duplex vertical Gardiner). The other tender was that of Messrs. Castle Bros.,-Wolf & Sons, $387 (Duplex Ingersoll-Rand).

Chief Q. M. D , Manila.—One Hydraulic Ram Press for masking saw dust blocks, 10 p. m. electrically driven with pump attachment.—Awarded Frank L. Strong, $2200 (Watson Stillman & Co.). There was only one tender.

City of Manila.—Furnishing and installing sewer pumping plant in the port district comprising 2 3 h. p. vertical motors directly connected to 4″ vertical-centrifugal pumps complete with starting panels.—The only tender was that of Frank L. Strong and the price ₱10,600 to supply General Electric motors and International Steam Pump Co.'s pump, the same as installed in the other city pumping stations.

Chief Q. M. D., Manila.—(1) 3 15 h. p. vertical, tubular boilers. (2) 4 25 h. p. portable tubular boilers. (3) 2 40 h. p. portable tubular boilers. (4) Laundry Machinery. The tenders were as follows:

Frank L. Strong, (1) $2:8; (2) $616; (3) $815. Castle Bros.,-Wolf & Sons, (1) $262.50; (2) $550; (3) $750. Fred Wilson & Co., (1) $360; (2) $662, (3) $850. Lambert & Springer, (1) $505. Frank L. Strong, (4) total $1480 (American Laundry Machine Co.). Other tenders were submitted for part of No. 4.

U. S. Medical Supply, Manila.—One Buffalo Steel Plate planing mill exhauster.—Germann & Co. $55, F. H. Thompson $104 50, Frank L. Strong $100.—Both contracts awarded Frank L. Strong.

Municipality of Shanghai.—Overhead Traveling Crane.—Messrs. Babcock & Wilcox received the contract at £920. The other tenders were:

	£.	*Weeks.*
Chatteris Engineering Co.	923	12
Sir Wm. Arrol & Co.	979	23
Carrick & Ritchie	990	15
Higginbottom & Mannock	1,058	14
Stothert & Pitt	1,080	21
Booth & Brothers	1,085	13
Royce & Co.	1,120	12
Cowans, Sheldon & Co.	1,175	22
Vaughan & Sons	1,206	15
Craven Brothers	1,300	16

Q. M., Manila.—25,000 Gallons Lubricating Oil.—Vacuum Oil Company at from 50 to 95 centavos per gal.

Chief Q. M., Manila.—1780 Coils of Rope.—Contract awarded the Johnson-Pickett Co., Manila. Price ₱0.154 per pound.

Municipal Board, Manila.—475 tons cast iron pipe, 73 tons cast iron specials, 15 tapping valves, 64 gate valves and 100 fire hydrants.—Successful bidders were Messrs. H. W. Peabody & Co. and Finlay Richardson & Co.

Philippine Government.—Supply of Oregon pine and redwood for six months ended December 31, 1911.—The successful bidders were Messrs. Norton, Harrison & Co. The contract is valued at ₱60,000.

City of Bangkok.—Installation of Filter Plant, Water Works.—Awarded The Jewell Export Filter Co. of New York, London and Calcutta.

Philippine Government.—15000 metric tons of Coal.—The following tenders were submitted·

Messrs. Macondray & Co., Inc., Wallsend coal, Manila ₱10.83, Iloilo ₱12.05, Cebu ₱12.05, Tacloban ₱12.57, Romblon ₱12.57, Jolo ₱13.82, Zamboanga ₱12.32, Balabac ₱13.95, P. Princesa ₱13.95. This company also bid on Japanese Ochi lump coal as follows: Manila ₱10.05, Iloilo ₱10 62, Cebu ₱10.62, Tacloban and Romblon ₱10.52, Jolo ₱13.56, Zamboanga ₱11.84, Balabac and P. Princesa, ₱14.55.

Messrs. W. F. Stevenson & Co., Ltd., bid on West Wallsend as follows: One cargo of 5,000 tons Manila, September delivery, ₱10.44, one cargo 5,000 tons, 10 weeks notice, ₱10.68. One cargo for provinces (5,000 tons) ten weeks notice, Iloilo and Cebu ₱11.71, Tacloban and Romblon ₱12.45, other ports ₱16.45.

C. B. Williams offered three bids as follows: Pacific coal, Manila ₱9 75, Iloilo ₱11.00, all other ports ₱11 49. His bid on Southern Australian coal, Mount Pleasant, etc., was: Manila, ₱10.84, Iloilo ₱12 09, all other ports ₱12.58. Hetton coal was offered by this bidder as follows: Manila ₱11.09, Iloilo and Cebu ₱12.34, all other ports ₱12.83.

The Mitsui Bussan Kaisha, Ltd., bid on Miike washed nut as follows: Manila ₱9.50 Iloilo and Cebu, ₱11.50, Tacloban and Romblon ₱12.45, Zamboanga and Jolo ₱13 60-Balabac and P. Princesa ₱18 30.

U. S. Government.—Carrying of Supplies from Pacific Coast to the Philippines—Contract awarded Messrs. Dodwell & Co. of Beattle Blue Funnel Line. Tenders follow:

General merchandise: Waterhouse & Co., $2.43; Dodwell & Co. $2.25; winter rate, $2.75. Coal: Waterhouse & Co., $5.00; Dodwell & Co., winter and summer $3.00. Lumber: Waterhouse & Co., $6.45; Dodwell & Co., summer rate $6.00; winter rate $6.75. Heavy weights, 7000 to 12000 pounds: Waterhouse & Co., $10.00; Dodwell & Co., $8 00.

U. S. Q. M. Department—Distribution Box Boat.—The contract was awarded W. S. Bailey & Co., the price being $11,365 U. S. C. delivered at Hongkong. This vessel will be fitted with a 100 h. p. engine supplied by The Gas Engine & Power Co. and Chas. L. Seabury & Co. (Consolidated) of New York City through their agent, Frank L. Strong, Manila.

PROPOSALS INVITED

Director General of Posts and Telegraphs, Bangkok.—Tenders will be received up to August 1, 1911, for the furnishing of 50,000 Kilograms of galvanised iron telegraph wire of 4 millimeters diameter, in coils of about 50 kilograms.

10,000 Insulators with protective enamelled iron caps.

10,000 galvanised swan neck bolts with screw ends and felt washers.

Bureau of Philippine Constabulary.—Tenders will be received up to November 1, 1911, for the furnishing of 200 capes, hoods, Khaki.

Christian inhabitants to such a point that the practicability of civilizing them might be conclusively demonstrated, and that the importance of doing it might be so fully established that the work *could not be dropped*. The progress already made by the Bukidnons and the Igorots of Benguet indicates that the day may come when these and similar non-Christian tribes can safely be allowed to manage their own affairs, if protected from interference from without. Whether or not it will be possible, in the reasonably near future, to relinquish full control over such people as the Moros, Ifugaos, Kalingas, Bontoc Igorots, and the wild Tingians of Apayao remains to be seen, but to turn these or any non-Christian tribes over to Filipino control at this time would inevitably mean the speedy loss of many of the important results already achieved.

"In quieting the fears of members of the more pacific tribes who have been assured by Filipinos that American control would be only temporary, and threatened with future punishment when it should terminate, I have repeatedly assured these simple people of my conviction that the American Government, having once undertaken their protection, would not desert them, and I earnestly hope that such a deplorable course may never be seriously contemplated."

The illustrations accompanying this article are published by courtesy of the Department of the Interior, Philippine Islands.

FAR EASTERN RAILWAYS

Royal Siamese Railways.—According to the *Bangkok Times* tenders were recently opened for the supply of permanent way accessories for the Southern line comprising 1,675 tons of fishplates, 280.1 tons of fish bolts and nuts, 1,029.5 tons of rail spikes, 9.5 tons of spring washers, and 596.2 tons of bearing plates; and quotations were asked for c. i. f. to Penang, Singora or Bandon, and Bangkok, and f. o. b. price nearest shipping port.

Thirty-one tenders were opened, of which sixteen came from British firms, seven from German firms, six from Belgium, one from France and one from Japan. Eight tenders were received from Bangkok firms as tenderers or agents. Mr. H. Gittins, the Controlling Engineer, opened the tenders.

Locomotives for Japan.—The contract for the supply of 12 tender-locomotives with superheaters for the Railway Board of Japan placed with the Borsig Works, Germany, is to be delivered on record time. The entire order was completed in 66 working days, the first of the engines being turned out by the works in 47 days.

Mukden - Vladivostok Line.—Advices from Peking are to the effect that the Board of Communications has approved the project proposed by the Russian Government for a Russian-Chinese line connecting those two points directly. The company proposed will have a capital of 5,000,000 roubles.

British Engineer-in-Chief for Hupeh-Hunan Ry.—A report from Peking under date of June 22 announces the appointment of A. H. Collinson, M. Inst. C. E., Engineer-in-Chief of the Hupeh-Hunan section of the Canton-Hankow Railway which, according to the terms of the Hu-Kwang loan, is to be constructed under British direction. Mr. Collinson is one of the leading British engineers in China and a well-known railway authority. He was chief engineer during the construction of the Shanghai-Nanking line and has since been associated with the road as consulting engineer and engineer-in-chief. His selection as chief of the engineering staff of the Hunan-Hupeh section will assure construction consistent with the best British standards and practice.

CHINESE EASTERN RAILWAY.—The report of the line for the year shows a gross income of yen 17,000,000 and expenditures amounting to yen 15,700,000.

SOUTH MANCHURIA RAILWAY.—The net operating revenue for the last half year amounted to yen 3,075,324.00 which with yen 1,803,855.72 carried forward made yen 4,879,179.72 available for distribution as follows:

Legal reserve fund....................	153,766.20
Dividend for shares owned by the Government....................	1,000,000.00
Dividend to shareholders other than the Government (6 per cent.)................................	60,000.00
Special reserve fund................	1,000,000.00
Bonuses and social expenses..	200,000.00
Sum carried forward...............	2,465,413.52

Out of the revenues 410,000 yen were spent fighting plague and the interest on £10,000,000 debentures was also an extraordinary expense that tended to reduce the net returns.

INDO-CHINA-SIAM RAILWAY.—The proposal of the two governments to connect their respective systems has met with favor and it is understood that the King of Siam has entered into a loan agreement with French bankers for this purpose. The line is to be an extension of the Saigon-My Toh section to Pnompenh and from Pnompenh to Battambang. The completion of these sections will bring the line within 75 miles from Patriew. Besides connecting Saigon with Bangkok, with the completion of the Peninsular line, Singapore will also be linked up in this comprehensive system.

AUSTRALIAN TRANSCONTINENTAL LINE.—The federal government of Australia has decided to construct the line connecting Port Augusta and Kalgoorie as a standard gauge railway (4′ 8½″) and later adapt the same gauge to all Australian lines.

JAPAN'S RAILWAY TUNNELS.—The difficult character of the country traversed by railways is emphasized by the extensive tunneling found necessary. One tunnel of the Central Eastern line is 15,275 feet in length or approximately three miles. Of tunnels over 2,000 feet in length there are 26 aggregating 115,387 feet or a total of over twenty miles.

PENANG HILLS RAILWAY.—The *Straits Echo* announces that the work of construction on this line will begin within three months. The estimates submitted by Engineer Bach placed the cost at $60,000 including the purchase of old plant, etc., and that the net revenue will be $12,000 annually.

THE SHANGTUNG RAILWAY CO.—The report for 1909 shows an increase in revenue from $3,400,000 to $3,700,000 equal to 9% compared with the previous year, while the expenditure increased from $947.339 to $999,723 or over 5.½%. There are 436 kilometers in operation and the freight, comprised principally of coal, represented 769,192 tons as against 641,279 in 1909, while the passengers carried numbered 654,128 compared with 641,279 in 1909. The total of net profits available for distribution, including 124,390 marks brought forward from previous account, were 4,696,229 marks disposed of as follows: reserve fund, 228,591 marks; special reserve, 228,591 marks; 6½ % dividend, 3,510,000 marks; preferred shares, 7.50 marks each, 405,000 marks, and balance forward of 182,580 marks.

SZECHUEN RAILWAY REDEMPTION LOAN.—The Peking government is now prepared to take over the property of the provincial company and will float a foreign loan for Tls. 10,000,000 for that purpose.

A. H. COLLINSON, M. INST. C. E.

Recently appointed Engineer in Chief of the Hunan-Hupeh section of the Canton-Hankow Ry.

TRAVELING RAILWAY LIBRARY FOR JAPANESE LINES.—The Japanese Railway Board has decided to place a library on all the express trains of the Tokaido line and extend a system of libraries throughout the country for use of passengers.

SIAM'S NORTHERN RAILWAY.—According to the Bangkok *Daily Mail*, the Northern line has been completed to Sala Me Puak and trains are running regularly to that point, but now it is in contemplation to extend the line about four miles to the Northwest to a place called Den Chai, and make this the terminus for the railway for the present. From Den Chai a road will be made to Phrae by the Government, and motor cars and motor lorries will be run on this to carry passengers and freight in connection with the trains. The ground between Den Chai and Phrae is practically level and the cost of a road will be much less than that of one from Sala Me Puak to Phrae.

The Railway Dept. also prefers Den Chai as a terminus as it is a broad level plain giving plenty of room for the construction of sheds and tracks for the railway yards, whereas the level space at Sala Me Puak is too confined. The expense of levelling more ground at the latter place would also be somewhat heavy.

The above plans are not absolutely settled yet, but they find favor with the high officials, so there is but little doubt that they will soon be carried through.

ACKLEY BRAKE EXPANSION.—This company has established agencies in Argentina and Brazil where Mr. Griffin S. Ackley has just concluded a successful business trip. The initial orders covered over 850 brakes for the tramways of the principal cities of South America.

In Australia, the Ackley Adjustable Brake is meeting with favor. An order was recently placed by the Adelaide Tramways Trust for the equipment of 50 cars with the Ackley brake, superseding the old style brake in use there. Substantial orders have also been placed in Japan. Mr. Ackley is at present on a trip to Europe where he established an agency at Milan, Italy, and organized a German Ackley Brake Agency.

CHINESE MANAGING DIRECTORS APPOINTED.—Peking advices are to the effect that the following appointments are under consideration: Wang Hsiao-cheng, managing director of the Hupeh section; Li Pao-hsun, of the Hunan section; Yew Liang, of the Szechuan section, and Feng Ko-chun of the Canton section. Director General Tuan Fang is said to have approved the appointments.

CHANGCHIAKAO-KULUN RAILWAY.—We are advised that the survey of this line has been completed and that upon approval of final location work of construction will begin immediately.

SUPPLY OF RAILWAY MATERIAL.—The Gloucester Railway Carriage and Wagon Company, Limited, England, have a contract for the supply of ten sets of metre gauge carriage underframes to the Assam-Bengal Railway. Messrs. Owen and Dyson, Limited, have an order for the supply of 20 pairs of steel wheels and axles which are required for these carriages. The Vacuum Brake Company, Limited, Queen Victoria Street, London, E.C., have supplied one thousand rolling rings, indiarubber, to the Burma Railways Company; Messrs. W. and T. Avery, Limited, Weighing Machine Makers, have in hand an order for the supply of six self-contained weighbridges and one combined weighbridge to this railway. The Heart Accumulator Company, Limited, had a large order for the supply of train lighting cells and acids to the East Indian Railway Electrical Department, and Messrs. J. Stone and Company, Limited, have an order for the supply of a complete train lighting equipment. The Birmingham Battery and Metal Company, Limited, Birmingham, have complied with an order for the supply of one thousand brass locomotive boiler tubes to the Bengal-Nagpur Railway. Messrs. J. Reid and Company, Limited, had a contract from this line for the supply of eight copper firebox plates for locomotives; and Messrs. Geo. Turton, Platts and Company, Limited, for the supply of 1,500 volute springs for rolling stock. Messrs. Dean, Smith and Grace (1908), Limited, Keighley, have supplied the Bengal-Nagpur Railway with a capstan lathe; and Messrs. John Lang and Sons, Lathe Makers of Johnstone, North Britain, some lathe chucks. Messrs. Cammell, Laird and Company, Limited, Victoria Street, Westminster, S.W., and proprietors of the Cyclops Street and Iron Works at Sheffield, had supplied this line with three dozen steel tyres for locomotive engines; and Messrs. Geo. Spencer and Moulton, Limited, have a contract for the supply of 500 indiarubber springs. The Birmingham Railway Carriage and Wagon Company, Limited, have a contract from the Burma Railways for the supply of the following 20 steel bogie underframes for the construction of third class passenger carriages, two spare bogie trucks and 270 bogie pivots. The Edison and Swan United Electric Light Company, Limited, Queen Street, London, E.C., and Messrs. Dorman and Smith, Limited, have supplied a quantity of electric light fittings to the Bengal-Nagpur Railway. The Brush Electric Engineering Company, Limited, England, had an order from the same line for the supply of a motor frame and switch pillar; and the Lancashire Dynamo and Motor Company, Limited, for a motor frame and control gear. Messrs. Siemens Brothers' Dynamo Works, Limited, have supplied a quantity of electric wire to the Bengal-Nagpur Railway. —*Railways and Shipping*.

PHILIPPINE MINING NEWS

THE BENGUET CONSOLIDATED.—The return for the month amounted to 99.5 ounces.

THE HEADWATERS MINE.—Mr. F. L. Cole, of Messrs. Cole & Hanlon, mining engineers, has assumed charge of the Headwaters plant in Benguet as consulting engineer. The installation is now complete and a few test runs have been made but no definite reports as to when the plant will be in full operation has been received.

THE MANCAYAN COPPER.—The work on the Chambers Group is still progressing. The crosscut has been driven about 655 feet and the owners anticipate an early contact with the main body. This is the only development work at present under way. We have been informed that foreign inquiries are being received and should the result of the work on the Chambers group meet expectations there is little doubt but that the properties in that section will soon be undertaken.

The Colorado Mining Co.—The installation of this company's plant on their property in Masbate is progressing favorably and by the latter part of August will be ready for preliminary runs. The company expects to be in full operation by September 15.

Division of Mines Bulletin—Mr. Warren D. Smith, chief of the division, has issued the following bulletin: "An examination of the Northern portion of Pangasinan has been made by Mr. Fanning of the Division of Mines, Bureau of Science, in order to investigate the reported occurrence of oil, gold, copper and other materials. About 300 square miles of territory was covered and the essential features of the geology, stratification, etc., were determined and mapped. The detailed report and geological map is on file at the Bureau of Science and is open to the inspection of those interested.

"In brief tertiary sedimentaries of limestone, sandstone and shale occur over the area except to the south and east. The structure is monoclinal with gentle dip to the northwest. Some slight folding has taken place but there is no evidence of extensive faulting or shearing.

"Many persons have reported that oil seepages are frequently seen in the rainy season, and that the smell of gas is very distinct. The examination was made in the dry season and no evidence of oil was seen, although the structure is adapted to oil accumulation.

"The area most favorable for such accumulations extends from Anda on the north to Balincaguin on the south and from west of Bani to Alaminos on the east.

"Artesian wells are soon to be bored at Anda, Bani and Alaminos which will probably give some evidence as to the possibility of oil. Some of the adjacent area can still be located as placer claims; or lease on occupied land can be had for small sums.

"The district was further examined for the occurrence of the valuable metals and the existence of gold, silver, copper, lead, zinc, and bismuth has been confirmed. However, as far as is now known, the deposits are of no commercial value.

The East Batan Coal Mining Co.—The new coal bunkers costing ₱38,000 are about completed. The cost was defrayed by a loan from the Bureau of Navigation under agreement to supply coal to the latter at ₱5 a ton until the obligation is met.

Philippine Precious Stones.—Specimens of precious stones, reported found in the islands, submitted to the Division of Mines, were found genuine and "the color and clearances, and freedom from flaws were noteworthy." The stones were of three species· beryl, variety emerald; garnet; and the spinel ruby. In testing positive optical and heat tests were employed in addition to those for defining the hardness of the specimens.

Paracale Mining District.—The Malaguit dredge was laid up for repairs on July 10 awaiting a new lower tumbler which arrived from the United States on the 16th. This is being installed. The return for the last half of June was 50 ounces.

The Paracale Gold Dredging Co. reported 252 ounces in one shipment. The period covered is not definite and this amount probably represents returns from the mill as well as the dredge.

The expert in the employ of Melbourne capitalists has been busy testing the ground of the Paracale district held under option from the owners and an agreement with the present lessees. It is expected that the preliminary work will be completed by the end of July. Upon this report will rest the immediate future of the district and the measure of participation by Australian capital.

FAR EASTERN ENGINEERING, CONSTRUCTION, FINANCIAL AND COMMERCIAL NEWS

ELECTRIC RAILWAYS, LIGHT, POWER, TELEGRAPHS, TELEPHONES, AEROPLANES, ETC.

F. M. S. Aviation.—The week at Penang was featured by flights by Mr. Kuller with his monoplane the "Antoinette." The average heights were from 250 to 300, and 800 to 1,000 were the maximum. At Kuala Lumpur, Mr. Kuller gave exhibitions during the month.

Aviation at Vladivostok.—M. Sedoff, a Russian aviator, has been making flights at this port, but owing to area being within the fortified zone, foreign aviators were not permitted to make the ascent.

Changsha Electric Light.—Advices from Hunan announce the opening of the electric plant at Changsha where 4000 lights have been installed.

Ceylon Wireless.—A wireless station is to be installed at Welikada, Colombo, having a range of 500 miles by day and 800 miles by night. It is expected completed by the end of the year.

Tokyo Underground Line.—A special committee representing the municipality is investigating an application for a charter to construct an underground railroad starting from Iidamachi near Kudan and connecting with the Nejiro railway station via Ushigone and Takata. The estimated cost is placed at yen 3,500,000.

Tokyo Electric Light Co.—The following accounts and distribution of profits for the half year were approved at the recent general meeting:

	Yen.
Sum carried over from previous half-year	316,676
Sum transferred from reserve fund	950,000
Profit for the half year	1,599,844
Total	2,866,521
Reserve fund	80,000
Reserve fund for equalization of dividends	950,000
Dividend (11 per cent. per annum, *ie.* 2.75 *yen* per old share and 22.92 *sen* per new share	1,439,184
Sum carried forward to next half-year	397,337

Yokohama Electric Co.—The following accounts and distribution of profits for the half year were approved last month:

Profit for the half-year	241,255.47
Sum carried over from previous half year	12,747.85
Total	254,003.32
Legal reserve fund	13,000.00
Reserve fund for redemption of debt	20,000.00
Bonuses	19,300.00
Dividend (12 per cent. per annum)	192,000.00
Sum carried forward to next half-year	9,703.32

At an extraordinary meeting held later a proposal to increase the capital from 2,200,000 yen to 6,500,000 yen was approved. The amalgamation with the Yokosuka Electric Light and Gas Co. and the Enoshima Electric Tramway Company was approved. For this purpose the Yokosuka company increased its capital from 250,000 to 500,000 yen and the Enoshima Co. from 360,000 to 500,000 yen. This brings the capitalization of the amalgamated company up to yen 7,500,000.

Japanese Test Foreign Aeroplanes.—Captain Tokugawa has been using the Farman and Bleriot machines in a series of tests in which he made short trips at 45 miles an hour at an altitude of about 1400 feet.

Chinese Telegraphs.—The head office has been transferred from Shanghai to Peking and the latter has now the status of a branch office. Taotai Chow Wan Pang, formerly director at Shanghai, is in charge of the office in Peking.

M. E. R. R. & L. Co.—The report of the Manila Electric Railroad and Lighting Corporation for 1910 states that the result of the operation for the year shows an increase in gross earnings over the previous year of $175,340, or 15.36 per cent., an increase in operating expenses and taxes of $10,589, or 1.76 per cent., and an increase in the net earnings of $164,751, or 3.45 per cent. The apparently abnormal increase in the earnings is largely due to the strike of 1909, which increased the expenses and reduced the gross earnings of that year. After allowing for this, the net earnings still show a satisfactory increase. The interest charges amounted to $275,625 and sinking fund requirements called for $25,889, and the directors have set aside $60,000 from the balance to establish a replacement and renewal fund, leaving an available surplus for the year of $344,356. The directors have declared and paid on the outstanding capital stock four quarterly dividends of 1 per cent. each, aggregating $200,000, leaving $144,356 over all disbursements and reserves, which has been transferred to surplus account, an increase over the previous year of $103,332, bringing the total surplus account, with reserves, up to December 31, 1910, to $750,124.

PUBLIC WORKS, DOCKS, WHARVES, BUILDINGS, ETC.

New Matadero for Manila.—The insular government has selected a site for an isolated matadero and animal quarantine station at Siliman on the Bataan coast near Mariveles for the better protection of the islands from animal disease and to insure a liberal supply of fresh meat.

The Bangkok Waterworks.—The *Bangkok Mail* says:

The contract for the installation of the filter plant for the Bangkok Water Works has been awarded to the Jewell Export Filter Co. of New York, London and Calcutta who will supply and instal a complete plant known as the Jewell open Gravity type which is generally acknowledged to be among the best systems of filtration for municipal uses.

The canal for the Bangkok water works will tap the river at Chiengreak 25 miles above the city and bring the water to Samsen where the purifying plants will be erected. It will first be pumped into four large settling tanks, 15' high, built of ferro-concrete, and run by gravity into the filters which are 17' in diameter and 12' ft. high, and after filtration passes into underground reservoirs, and then is again pumped to raised reservoirs, so that it will flow through the distributing pipes by its own gravity.

The daily capacity of this plant is 28,800 cubic meters or 6,336,000 gallons.

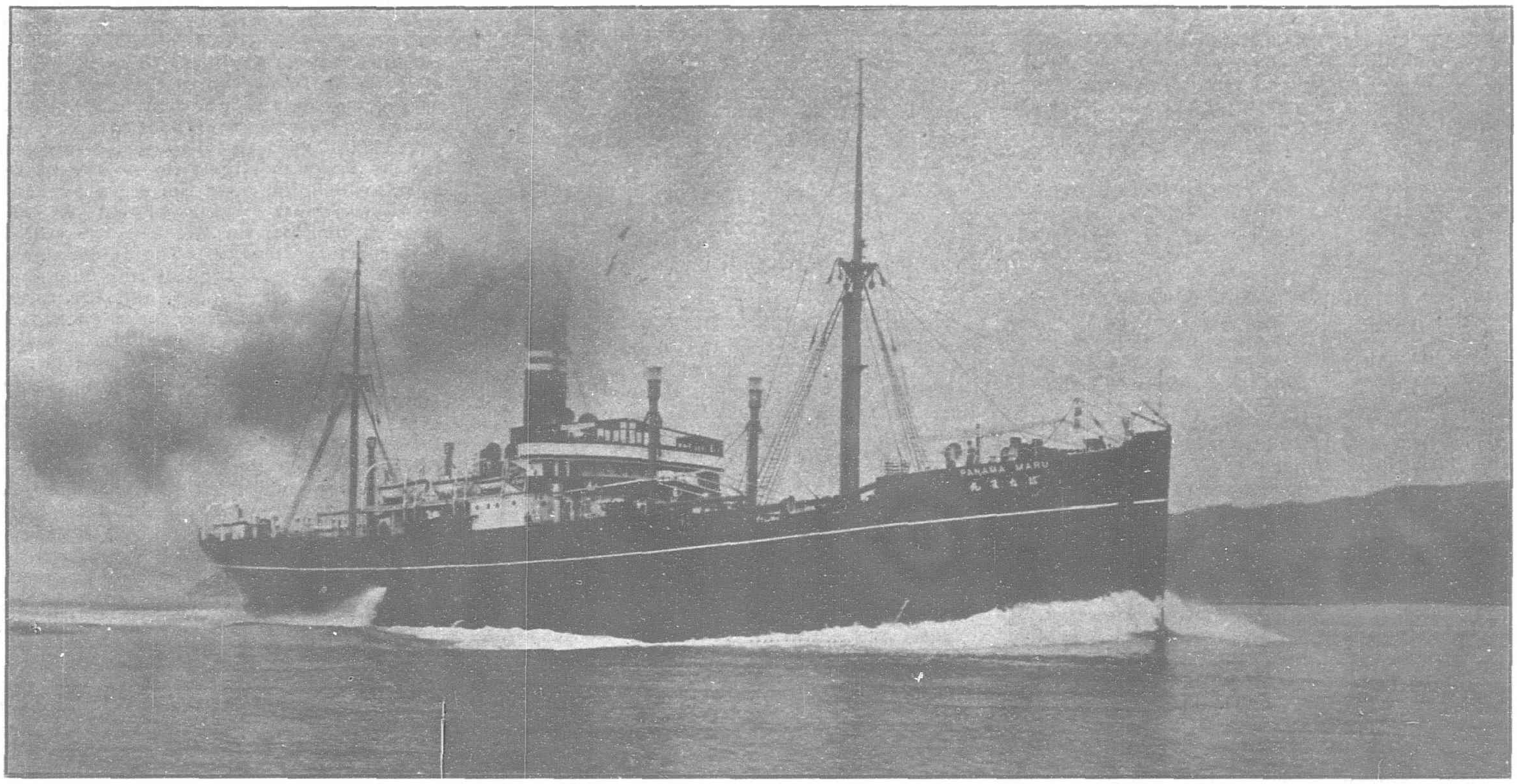
The supply of pipes was awarded, last July, to the Société de Pont-à-Mousson, the length of piping amounting to about 93 kilometers and the diameter of the pipes varying from 700 down to 40 millimetres. The total tonnage is about 5800 tons. The pipes began to arrive here last March, and four shipments of pipes with some of their accessories have so far been received, amounting to about 1300 tons.

The laying of the pipes, in the streets of the town, will begin in August or September, as soon as the accessories, such as bends, reduction pipes, cocks, valves, penstocks, etc., shall have arrived in sufficient quantities.

The necessary plans for the buildings required for the filters, settling tanks, filtered water reservoirs at the station and the elevated reservoirs for the distribution in the town, are ready and the Government will not be long in calling for the necessary tenders for their construction.

Lastly, the supply of the centrifugal pumps with their electric motors will soon be given out to public tender.

New Peking Club.—The construction of the new club at Peking which will cost $50,000 is now under way and it is expected completed by July, 1912.



S. S. PANAMA MARU, SISTER SHIP TO THE CANADA MARU, THE LAST SHIP, CONSTRUCTED BY THE MITSU BISHI SHIPBUILDING YARD AT NAGASAKI FOR THE O. S. K.

Fusan Harbor Works.—The construction of Fusan harbour, started by the old Korean Government, *costing* 1,500,000 yen, was completed in June. Harbor improvement planned by the Government to cost 3,820,000 yen, defrayable in three consecutive years, has begun. The scheme comprises removal of sunken rocks, construction of quays and reclamation of foreshore.

Burmah Public Works.—During 1910 there were 1,732.75 miles of roads constructed throughout the dependency. Many wooden bridges were superseded by reinforced structures.

Shameen Water Supply.—At a recent meeting of the ratepayers of the British Concession it was decided to secure an estimate from Messrs. Howarth, Erskine & Co., for the installation of a Jewell Rapid Filter and plant with mains, etc., for the supply of 120,000 gallons daily from the Canton River. The proposed plant will probably cost $100,000. The proposal to bore artesian wells for the purpose has been considered for some time but no definite estimate of cost or that water might be secured at reasonable rates had been made.

Kobe Water Supply.—The sum of $4 925,000 has been voted by the municipality of Kobe for the construction of a new system to be completed in 12 years. Water is to be taken from a mountain stream, the Muko River, in the vicinity of Sanda, Arima County, about 22 miles northeast of Kobe. Two reservoirs will be situated on this stream, one at Sengari-mura, Arima County, and one at Arai-dani-mura, Kawabe County, 19½ and 17 miles, respectively, from Kobe. Water will be piped from these reservoirs to the Kasugano filter beds, on the east side of Kobe, through five tunnels (total length, 2½ miles) and six water-pipe bridges (length, 2½ miles). When completed the city will be able to supply 2,500,000 cubic feet of water per day.

Osaka Water Supply.—Water is taken from the Yodo River, and the intake tower, 11 filter beds, 5 settling ponds, and pumping stations are situated at Nakanomachi, Kita-ku, and three service reservoirs are inside of Osaka Castle, holding 626,428 cubic feet of water each. *Fifteen pumps are in use,* of which 9 are American (Washington system, 30 volts) and 6 of English make. These can pump 3,000,000 cubic feet of water per day. There are 12 boilers of English make. The total length of pipe is about 350 miles.

An extension is proposed costing 9,000,000 yen to be finished in 1914, capable of supplying 8,640,000 cubic feet daily with sufficient pressure to force water to a height of 90 feet. The new works will be located at Kunyama on the Yodo River and will comprise two intake towers 22½ feet high, 14 filter beds, 7 settling ponds and four service reservoirs. There will be intake pumps with a capacity each of 1.000 cubic feet of water per minute to a height of 25½ feet, 8 boilers and forwarding pumps capable of forcing 1,000 cubic feet of water to a height of 150 feet per minute. The intake pipe will be 45 and 48 inches, to the filter beds from the towers, 46 and 36 inches and to the pumping station 36 inches. The city mains will be from 27 to 42 inches.

SHIPBUILDING, MERCHANT MARINE AND FISHERIES.

Indo-China S. N. Co.—At the annual meeting of the shareholders the following report was submitted for approval:

£20,000 has been transferred from the Underwriting Account, which will then stand at £114,200, and £3,000 has been written off the expenses of the debenture issue. After providing for the usual depreciation and the interim dividend paid in November last there remains a balance of £27,998, *out of which* the Board of Directors recommend the payment to the holders of Preferred Ordinary shares of 3 per cent., being balance of the dividend for 1908, and 6 per cent., being the dividend for 1909, leaving the dividend for 1910 still in arrear. A balance of £5,683 is carried forward.

The Shanghai Dock Report.—The report of the Directors of the Shanghai Dock and Engineering Co., Ltd., for the year ended April 30, 1911, has now been issued to the shareholders. The net profits, including the amount brought forward from last year, are Tls. 149,531.02. This amount the Directors *recommend* be dealt with as *follows*:—A dividend of Tls. 2.50 per share, Tls. 188,000.00; and amount to be carried to new account Tls. 11,531.02.

China's Foreign Shipping.—The total number of foreign ships entering Chinese ports was 219,810, with an aggregate tonnage of 88,796,699. Of this number 28,000 were British ships (34,253,439 tons), 31,197 Japanese (18,903,146 tons), 5,367 German (7,060,521 tons), 3,766 French (4,923,492 tons), 2.541 Russian (1,441.345 tons), 1,286 American (725,279 tons), and 146,075 Chinese (19,597,821 tons). The total value of goods transported in and out of Chinese ports on foreign vessels amounted to 19,177,372,633 taels, of which goods valued at 785,542, 852 taels were carried by British ships. Japan comes next with cargoes valued at 306,329,807 taels, then Germany 157.303.503 taels, France 77,430,955 taels, and Russia 61,828,000 taels, while American ships carried cargoes from China valued at 7,869,630 taels.

New C. P.R. Services.—Two new steamers are reported under construction for this company to be placed on the Pacific run and include Honolulu as a port of call. They will be 17,000 tons and have a speed of 23 knots

HONGKONG SHIPPING.—According to the Harbor Master's report all records were broken during 1910 when 547,164 vessels of 36,534,361 tons entered and cleared, an increase over the previous year of 19,884 vessels and 1,703,516 tons and exceeding all previous records by 15,052 vessels and 506,051 tons.

CHINA'S SHIPPING.—The Ministry of Posts and Communications intends to raise a foreign loan of 25,000,000 taels for the purpose of expanding the shipping business by ordering 13 new steamers to ply between Europe and Asia.

SHELL TRANSPORT AND TRADING CO.—The Shell Transport and Trading Company last month announced a final dividend of 2s. 6d. per share, free of tax, making 22½ per cent. for the year 1910 and a first interim dividend of 1s per share for the year 1911.

SHIMONOSEKI FERRY STEAMERS.—The Kawasaki Dockyard has secured an order to build two ferry vessels (3,000 tons each) for the run between Shimonoseki and Fusan, from the Railway Bureau. The cost of the vessels, it is said, will exceed 600,000 yen each. These vessels are to be completed within 21 months.

P. & O. DIVIDEND.—The Directors of the Peninsular and Oriental Steam Navigation Company announce a dividend at the rate of 5 per cent per annum on the Preferred Stock, and an interim dividend at the rate of 7 pert cent. per annum on the Deferred Stock of the Company for the half-year ended 31st March and that warrants for the same will be posted to-day.

FIRST JAPANESE TRAMP STEAMER TO EUROPE.—The Japanese steamer "*Koju-Maru*," 8,060 tons, is to ship a cargo of beans and proceed to Europe. This, the *Japan Chronicle* says, is said to be the first Japanese tramp steamer to carry freight to Europe.

LAUNCH OF JAPANESE DREDGER.—The launch of a big dredger, to be used in connection with the improvement of Shimonoseki Strait, which is now completed at the Uraga Dockyard, will take place on March 15th. The dredger, which is the biggest of the kind ever built in this country, is of 1,250 tons gross.

NEW O.S.K. STEAMER.—The work of fitting the *Canada-maru* at the Mitsu Bishi Shipbuilding Yard, Nagasaki, is now being pushed forward, and the vessel is expected to be ready for sea this month. She will be placed on the Pacific service of the Osaka Shosen Kaisha.

JAPANESE NAVAL DOCK EXTENSION.—The Yokosuka arsenal is to construct another large dock-yard. The projected dock will be 780 by 288 feet, and will accommodate ships of 30,000 tons displacement.

MINES, MINERALS AND THE METAL TRADE, MACHINERY, ETC.

F. M. S. TIN RETURNS.—The May output amounted to 15,226 piculs.

SARAWAK OIL FIELD.—The *Sarawak Gazette* reports that at Miri where the deposits of oil are found a bore has been driven to a depth of 800 feet from the top of a hill and another is being made at the foot. Tanks with a capacity of 4,000 tons will soon be erected and the site for a refinery covering 430 acres has been selected. Pipes are to be laid a distance of about 50 miles to Maura Besai where wharves and tanks will be erected to supply oil burners.

TIN DREDGING AT TONGKAH.—Chas. Ruwolt Prop., Ltd., recently designed and constructed a very powerful bucket dredge to the order of the Tongkah Compound Dredging Co. N. L., to operate on their leases at Puket, Siam. The plant is for the recovery of tin, and is said to be the most powerful and complete bucket dredge ever built in the Commonwealth, says the Bangkok *Times*.

The buckets are 6 cubic feet capacity, close-connected type, and will handle as much as 20,000 cubic yards per week of 130 hours when working in favourable ground. The total weight of the complete plant will be about 550 tons, and the price of the plant ready for work at Tongkah Harbour will be about £18,000.

The output for May, with five dredges working, was 2,041 piculs, which is a record. For five months in 1911 it is 6,336 pikuls, against 4,005 for this period in 1910 and 2,652 piculs in 1909.

STRAITS TRADING CO.—The net profits for the half year ended March 31, 1911, amounted to $525,780.58 and with a balance of $86,664.95 forward from former account made $612,445.53 available for distribution as follows: dividend of $1, and a bonus of 50 cents per share to shareholders, absorbing $450,000; $50,000 added to the reserve fund, which will then stand at $1,500,000; $25,000 transferred to employees' bonus account, and the balance of $87,445.53 be carried forward to a new account.

GOLD DISCOVERY NEAR IPOH.—The Malay *Mail* publishes a dispacth from Ipoh to the effect that gold in large nuggets has been found on Foo-Choo Choon's property in Batang Padung.

MALAYAN TIN DREDGING.—A prospectus has been issued with the object of working alluvial tin ground by bucket dredging. The capital to be issued is 80,000 shares of £1 each. Mr. H. D. Griffiths, the general manager of the Tronoh mines, has reported favourably on the project.

SECOND SAGHALIEN SYNDICATE.—At the first ordinary meeting in London the discussion developed the fact that a subsidiary company has been organized to take over fifty oil claims and five coal claims. It appears that on the company's property coal was developed in 15 places with seams 15 to 20 feet in width. Borings demonstrated that the deposits had a depth of 1,200 feet. The quantity of coal blocked out is estimated at about 30,000,000 tons.

FINANCIAL, COMMERCIAL AND MISCELLANEOUS.

PAPER PULP FROM BAMBOO.—The report of Consul General O'Brien Butler at Yunnanfu states that the Société de Pulpes de Papeteries du Tonquin that has secured large concessions in Indo China proposes restricting their operations to the manufacture of pulp from bamboo for export to Japan. The concessions are located in the districts of Vietre and Yenbay and its factory located at Vistri will be in running order next month.

CHINA TO MINT SILVER.—The silver mines of Nanking, Mukden, Kwantung, Hupeh and Szechuan have been directed to supply sufficient bullion for the minting of Tls. 10,000,000 worth of silver coins.

THE DAI NIPPON SUGAR REFINERY CO.—The following is the accounts and recommendations approved, at the recent general meeting:

Net income	749,285.68
Carried over from previous account	168,895.78
Total	918,181.46
Legal Deposit	50,000.00
Special Deposit	300,000.00
Special reward for Directors and employes	75.000.00
Dividends (5 per cent.)	232,500.00
Carried to next account	260,681.46
Total	918,181.46

FORMOSAN SUGAR CONTROL.—The Formosan sugar manufacturers agreed last year to confine the output of centrifugal to 317,000,000 in allowing 165,000,000 kin for refined sugar 116,350,000 for Japan, 3,000,000 for home consumption and 20,000,000 for foreign export, leaving a margin of 12,000,000. This arrangement has been enforced and the output was well within the figures named, and as anticipated prices were maintained.

SHANGHAI TIMES SOLD.—The announcement is made that Mr. John O'Shea has purchased the *Times* from Dr. J. R. Ferguson who has been appointed general adviser to the minister of posts and communications.

THE SHANGHAI MERCURY LTD.—A final dividend of 6%, making 10% for the year ended April 30, was directed paid.

FORMOSAN SUGAR CO.—The Horisha Sugar Manufacturing Company is to be established in Horisha, Formosa, under the auspices of Mr. Jiro Katsura, the younger brother of Prince Katsura, the Premier, M. Y. Ataka, of Kobe, and thirty others. The new company, which has a capital of Y2,000,000, is to install up-to-date machinery, the annual output being expected to reach 50,000 bales. A profit of Y177,000 a year is estimated.

BANQUE DE L'INDO-CHINE.—The Banque de l'Indo Chine reports a net profit for the year 1910 of f.6,114,089, against f.5,281,273 for the previous twelve months. After appropriations for reserves, depreciations, &c., there is a sufficient amount to pay a dividend to the shareholders of f.50. The reserve, provident, and agency capital funds amount in all to nearly f.43,000,000, whilst the Bank's capital is f.48,000,000, of which a quarter is paid up.

LONDON METAL MARKET

JUNE 9, 1911.

COPPER.	£	s.	d.		£	s.	d
*Tough cake and ingot	59	0	0	..	59	10	0
*Best selected	59	0	0	..	59	10	0
*Electrolytic	59	5	0	..	59	15	0
*Sheets and sheathing	70	0	0	..	—		
*Flat bottoms	73	0	0	..	—		
STANDARD †Cash	55	11	3	..	—		
STANDARD †Three months	56	1	3	..	—		
*Copper tubes, seamless per lb.	0	0	8¼	..	—		
*Lake	59	10	0	..	60	0	0

* Less 3½ per cent. † Net.

ALLOYS.							
Brass: Wire	0	0	6⅝	..	—		
,, Tubes (solid drawn)	0	0	6⅝	..	—		
,, Sheets	0	0	6⅞	..	—		
TIN.							
English ingots, f. o. b.	202	0	0	..	204	0	0
,, bars	204	0	0	..	206	0	0
,, refined	206	0	0	..	208	0	0
Straits... Cash	222	0	0	..	—		
Straits... Three months	190	0	0	..	—		
Australian spot	—			..	—		
Banka (in Holland) Cash	207	10	0*	..	—		
Banka (in Holland) Three months	—			..	—		

*Close of market for prompt.

LEAD.							
Spanish or soft foreign	13	2	6	..	13	5	0
English pig, common	13	5	0	..	13	7	6
,, L. B.	13	15	0	..	—		
,, sheet and bar lead	14	17	6	..	—		
,, pipe	15	7	6	..	—		
,, red	15	17	6	..	—		
,, white	18	15	0	..	—		
,, patent shot	13	5	0	..	—		
SPELTER.							
Silesian ordinary brands	24	5	0	..	24	10	0
,, special brands	24	15	0	..	25	0	0
English Swansea	25	2	6	..	25	5	0
Sheet zinc	29	0	0	..	—		
ANTIMONY.							
Antimony	29	0	0	..	30	0	0
,, Crude	14	0	0	..	14	10	0
,, Ore (basis 50%)	9	0	0	..	9	5	0
QUICKSILVER.							
Flasks, 75 lbs. warrants	8	5	0	..	—		
ALUMINIUM.	Per ton.				Per ton.		
98-99 per cent.	60	0	0	..	61	0	0
NICKEL.	Per ton.				Per ton.		
98-99 per cent. guaranteed	167	10	0	..	171	0	0

PLATINUM.

Per oz. Troy, 166s. 6d.; nominal and subject to negotiation.

MANGANESE ORE.

One c. i. f., U. K. ports	Per unit.*		
Indian or Brazilian, 50 per cent.	£0 0 9¼	to	£0 0 9½
,, ,, 48 ,,	0 0 9	..	0 0 9¼
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